ALBERTA ADVISORY COUNCIL ON ELECTRICITY

REPORT TO THE ALBERTA MINISTER OF ENERGY

JUNE 2002

ALBERTA ADVISORY COUNCIL ON ELECTRICITY

June 24, 2002

The Honourable Murray Smith
Minister of Energy
Government of Alberta
404 Legislature Building
Edmonton. Alberta, T5K 2B6

RE: Council Report

Dear Minister,

The Advisory Council on Electricity is delivering to you today the report regarding its deliberations on the restructuring of the Alberta electric industry. These deliberations were undertaken to accomplish the initial mandate provided to the Council early in 2001. However the Council found it necessary to go beyond the specific areas of the mandate and consider the electric system as a whole in order to ensure that its deliberations were thorough and in the proper context. The comments and recommendations in the report reflect this broader view.

The Council would like to meet with you, and Department staff as you may wish, once you have had an opportunity to review the report. The purpose of a meeting would be two-fold. First, the Council would like to review with you what it considers to be important at this stage of restructuring and for going forward from here. Second, the Council would like to hear from you what plans you may have for the Council now that we have reached this milestone.

The members of Council wish to thank you for the opportunity to undertake this work and provide input to the complex undertaking of restructuring the Alberta electric industry.

L. F. Bolger
Chairman

ALBERTA ADVISORY COUNCIL ON ELECTRICITY

REPORT TO THE ALBERTA MINISTER OF ENERGY

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COUNCIL MEMBERS

Name	Representing
L. F. Bolger	- Chairman
D. Astner	- Alberta Federation of Rural Electrification Associations
J. R. Davies	- Industrial Association of Southern Alberta
J. Hayden	- Alberta Association of Municipal Districts and Counties
M. Higgins	- Public Institution Consumers Association
J. Joys	- Industrial Power Consumers and Co-Generators of Alberta
R. Kline	- Independent Power Producers Society of Alberta
D. Lowry	- EPCOR
J. R. McDougall	- Alberta Research Council
M. D. McMaster	- Power Pool of Alberta
R. M. Nicolay	- ENMAX
S. Schellenberger	- Business Community
M. W. Smyth	- Public Member
B. Stazenzki	- Environmental Resource Centre
J. Wachowich	- Consumers Association
Consultants	
A. Brummell	- GBN Canada
T. D. Harbottle	- GBN Canada
T. D. McGee	- Intenco Energy Consultants Ltd.

Note: Regardless of the constituency shown, it was generally agreed that all Council members would participate in a manner that would attempt to further the public interest.

ALBERTA ADVISORY COUNCIL ON ELECTRICITY

REPORT TO THE ALBERTA MINISTER OF ENERGY

Executive Summary

Introduction

This report has been prepared to review the deliberations of the Alberta Advisory Council on Electricity with regard to the restructuring[1] of the electric industry in Alberta. The purpose of the deliberations was to consider the strategic issues affecting restructuring over the long term, with particular focus on the small consumer retail market, and to prepare recommendations that would help ensure the success of restructuring over the longer term to the year 2012.

Vision 2012

The Council utilized the following longer-term vision as a guide in its work:

Electricity restructuring will have enabled the development of efficient and competitive markets attracting investment and encouraging innovation that will lead to fair and equitable prices for consumers and other market participants.

Current Industry Status

The restructured system is in place and operating, but progress has not been even across the system. Some segments are functioning in a way that will allow them to contribute to **Vision 2012**. Others are not yet in that state. Uneven progress is to be expected early in a restructuring process and it also means that achieving **Vision 2012** is not yet assured. Enhancements to the system, some major, are still required to ensure successful transition to a well-functioning competitive electricity system in Alberta.

The Process

The work of the Council involved three phases:

1) Development of scenarios on the future of the electric system in Alberta.
2) Identification and analysis of strategic issues[2]
3) Development of recommendations to encourage the evolution of the system toward a well-functioning competitive market.

1. The term "restructuring" is used in this report rather than "deregulation" because parts of the industry will remain regulated. Restructuring is the process of replacing regulations by markets where competitive markets can function.
2. Strategic issues involve decisions which have a significant impact, are not easily reversed, are highly interconnected with other decisions or involve a critical step in evolving the system toward Vision 2012.

The Council used the scenario methodology to gain a deeper understanding of the factors influencing the system and the key uncertainties that impact on the industry. That work emphasized the complexity and interconnectedness of the system. The scenario work also emphasized that forces beyond Alberta's control can influence future outcomes. Fluctuations in gas prices, electricity demand, changes in the US, regulatory decisions in other jurisdictions and unexpected business events such as the bankruptcy filing by Enron can all significantly impact the electricity market in Alberta.

Through the scenarios, the Council identified and defined ten critical issues that when resolved, represent an overall framework for a more likely successful evolution to **Vision 2012**. The Council decided that its role would be to point out the issues and make recommendations at a high level as to importance and priorities for the longer-term success of restructuring. However, the Council concluded it would not make detailed recommendations on how to resolve those issues. The latter decision was taken because the Council does not have the expertise to go into details on resolving issues, and there are several other committees set up with the expertise to recommend how to resolve specific issues. The Council also identified several key findings that emerged from its deliberations.

Key Findings

1. **Restructuring is still at an early stage and the evolution to a fully functioning restructured electrical industry will take a number of years.**
2. **Post 2001, there is a relatively stable market situation and this provides an opportunity for Alberta to resolve some of the electricity restructuring issues before difficult events for the industry recur.**
3. **There are many complex and highly interconnected issues remaining to be dealt with in order to complete restructuring and position the industry to achieve Vision 2012.**
4. **Many external forces act on the electric system, and increasingly these come from outside Alberta.**
5. **Because of uncertainties in the future, there is still a considerable risk of experiencing major difficulties.**
6. **The most critical and pressing cluster of issues (the 'foundation issues') spans generation (including reserve capacity), transmission and export/import capacity. Not addressing this cluster of issues as soon as possible considerably increases the risk of difficulties and obstructions over the longer term.**
7. **There is a need for a coherent and comprehensive policy matrix for resolving issues and creating confidence in the marketplace.**
8. **A strong, liquid and competitive wholesale market is critical to achieving Vision 2012. Adequate generation, transmission capability and export/import capacity are key factors for a competitive wholesale market.**
9. **A strong competitive retail market for the small consumer is unlikely to develop without a robust and liquid wholesale market.**
10. **It will be challenging to develop a competitive retail market for small consumers in Alberta because the market is small, there are strong entry barriers, and the small consumer has not yet developed an interest in participating in the market.**

11. **The retail market for the small consumer is going to take longer to develop than is generally anticipated and there are important preconditions to be put in place such as load settlement, billing system, regulatory harmonization, new technology access and education.**
12. **Alberta has a limited ability to export and import electricity. If Alberta remains limited in this respect, it will be much more difficult to resolve the foundation and other issues and achieve Vision 2012.**
13. **There are important opportunities for new technologies to be employed across the electricity system and these should be encouraged.**
14. **Although the government must minimize intervention and rule change, there is an important on-going balanced role for government relative to the electrical industry. This is because restructuring is going to take some time, and parts of the electricity system will likely remain regulated indefinitely.**
    - **The primary role of government is to establish the required framework of policies and legislative regulations, and a clear delineation of objectives.**
    - **The government needs to monitor restructuring to ensure progress is being made toward Vision 2012.**
    - **The Council is concerned the Department may not be well positioned to fulfill this ongoing role, given the complexity and number of other energy issues it is also responsible for managing.**

Principles

The Council determined that the following principles must be carefully followed by the government as restructuring develops:

- Have patience – let the market work.
- Reduce uncertainty in the industry environment by minimizing intervention and keeping rule changes to an absolute minimum.
- Communicate the government's commitment to these principles and demonstrate this commitment through its actions.

Recommendations - Critical

The Council offers four critical, overarching recommendations:

- The electrical industry is a strongly interrelated system of parts, and decisions on the parts cannot be made piecemeal but must be made with full consideration of impacts on all related parts of the system.
- The critical starting point and necessary precondition for successful restructuring is a strong, liquid and competitive wholesale market, the government must ensure that the conditions are right for this market to develop. The critical conditions are adequate generation, which in turn requires adequate transmission capacity, and a clear policy on the export and import of power. These three critical conditions will take several years to implement. Therefore the government must put in place as soon as possible the policies and regulations that will enable the market to resolve these issues.

- Alberta has a relatively small retail market with many entry barriers and risk of market power abuse. It will be challenging to develop a small consumer competitive retail market that provides the consumer with choices, competitive prices and provides an adequate degree of consumer protection. Therefore it is important that government provide leadership in establishing necessary preconditions (load settlement, billing systems, consumer education and access for new technologies). Lastly, government must also ensure a level playing field created through a common framework of regulations across the province for all market participants.
- Given the number of different complex energy matters that must be managed in addition to electricity, the Department of Energy must continue to review its organization and staffing against the restructuring challenge to ensure that it has adequate skills to complete restructuring successfully.

Recommendations - General

The intent of these recommendations is to establish an overall plan to address the critical issues that must be dealt with early to ensure success for restructuring in the long term.

Generation

- Ensure that the framework of policies and regulation are in place to enable and attract timely investment in generation.
- Reserve capacity for security/reliability must be examined to determine if supply is adequate for this purpose. The determination should be made by an operating entity such as the power pool or the proposed ISO.

Transmission

- Determine if existing policy and regulations will enable Vision 2012 to be achieved, or modify them accordingly.
- Develop a comprehensive policy on transmission that will encourage transmission and generation to compete for the overall lowest cost.
- Working with industry stakeholders, the government must evaluate whether Alberta should participate in a regional transmission organization, such as RTO West, in order to enhance competitive markets for electricity in the region.

Establish an Export/Import Policy

- Embark on an immediate public consultation process to identify and resolve concerns including the question of costs and benefits and recognition of potential environmental implications.
- With Albertans' input, establish and communicate the Government's position on the export/import capability for the province.

Distribution

- Government and industry must work together to put in place the preconditions for common business practices in distribution and the retail market, such as a common load settlement and billing system.

- Consolidate the regulation of the transmission *and* distribution system (wires) for all players across the province under one efficient regulatory administration.

Market Power

- Establish a robust set of guidelines to define anti-competitive behavior at all levels in the electrical system. These guidelines should include long term holding rules relative to installed generator capacity.
- Establish an effective market surveillance process and a strong, independent monitoring agency that will track industry behavior against the guidelines to ensure market power is not abused in the wholesale and retail markets.
- Provide a strong enforcement mechanism to ensure that rules and guidelines against anti-competitive behavior are adhered to.

Competitiveness

- Establish an environment that will encourage provision of competitive services, such as time of use metering for small retail consumers, to enable consumers to manage their electricity consumption more effectively.
- Support the adoption of new technologies that will help give small consumers choice and increase competition in this market.
- Proactively identify and minimize barriers/impediments to adoption of new technologies for all aspects of the system.

Consumer Awareness and Education

- Recognizing that the small retail consumer has not yet developed an interest in the electricity market and does not yet appear to be interested in learning about it:
  - Government and stakeholders should work together to start delivering a communication program to raise the level of awareness of the new electric market and help consumers participate in the market.
  - Government and stakeholders should work together to develop an education program to help small consumers to prepare to participate in the market.

Structure & Roles

- On an ongoing basis, the government must monitor the effectiveness of the organizations and roles put in place to facilitate the operation of the restructured electricity industry. Depending on the outcome of such monitoring the government may have to periodically propose, implement or foster changes to the organization and roles, after stakeholder consultation, as was done with the Discussion Paper on Alberta Electric Industry - Recommended Structure in May of 2002. However, the government must balance their actions in this regard with our guiding principle, namely that they reduce uncertainty in the industry environment.

THE ALBERTA ADVISORY COUNCIL ON ELECTRICITY

REPORT TO THE ALBERTA MINISTER OF ENERGY

Introduction

This report reviews the deliberations of the Alberta Advisory Council on Electricity with regard to restructuring of the electrical industry in Alberta. This report is premised on the government's continued commitment to restructuring this industry. The goal of the Council was to identify and consider the strategic issues that have to be resolved to successfully restructure the industry, with particular focus on the small consumer retail market. Specifically the Council was to prepare recommendations that would help ensure the success of restructuring over the longer term to the year 2012.

Vision 2012

The Council utilized the following long-term vision as a guide in its work:

Electrical industry restructuring will have enabled the development of efficient and competitive markets attracting investment and encouraging innovation that will lead to fair and equitable prices for consumers and other market participants.

This vision is premised on the government's repeated assertions that they will continue with the restructuring of the electrical industry. The vision also sees this restructuring as delivering fair and equitable prices and a market that provides enhanced consumer protection.

Please refer to Appendix A for a more comprehensive review of the Vision 2012.

Mandate

The Alberta Advisory Council on Electricity (ACE) was announced by Premier Ralph Klein on February 8, 2001. The government appointed a diverse group of stakeholders to the Council. The mandate of the Council is to 'advise the government on longer term issues surrounding electricity deregulation.' Specific points in the mandate included the following:

- To provide strategic advice to the Government of Alberta on consumer related issues in Alberta's deregulated competitive market place.
- To pay particular attention to the small consumer retail market.

- To formulate the strategic advice on the basis of a longer term (10-year) forward consideration of the changing Alberta electrical supply system.
- The Council will report to the Minister of Energy.

The Council has taken a longer term and strategic view of electricity restructuring. In its early consideration of the small consumer retail market, the Council very quickly found that it could not consider any one segment of the industry in isolation from the other segments. This is because the parts of the system are highly interconnected, and an action in one segment can have numerous reactions, which in turn strongly influences the behavior of other segments. The interconnected nature of the system is illustrated by the Alberta Electrical System Diagram shown in Appendix B. The Council therefore looked at the electrical system in Alberta as an 'integrated whole' and tried to account for the reactions caused by interconnections between the sectors in the system.

The Council also concluded that it would look for the issues that over time would impede progress toward **Vision 2012.** These issues would be defined and prioritized at a high level to determine what must be done to achieve successful restructuring. However, the Council did not attempt to develop detailed recommendations for resolving the issues. This is because the Council decided that it did not have the expertise to make detailed recommendations, and also because there are a number of committees set up to look at specific issues that have the expertise to deal with them in detail.

SCENARIOS

Scenario Development

The Council recognized that single line forecasts of the future cannot account for the myriad of unpredictable developments that can and do occur to influence the electrical system. It was agreed at the beginning of the work that the use of scenarios, which offer alternative visions of future outcomes, was the appropriate way to proceed. It was also recognized that a tool was needed to examine the "what if" questions that might arise. The Council's view that the electrical system is facing considerable uncertainty over the 10-year period has been reinforced with recent significant external events including the terrorist attacks of September 11, 2001, California's recent decision to end retail competition and the bankruptcy of the Enron Corporation. Such events could all have important implications for electricity restructuring in Alberta.

The diverse background of experience and knowledge in the Council membership was very useful for developing the scenarios. The Council wishes to emphasize that the scenarios are not a prediction of the future, nor does the Council necessarily advocate any event, decision or outcome portrayed in the scenarios. These scenarios are merely possible alternate futures that the electricity industry and its restructuring may have to go through to successfully achieve **Vision 2012.** The scenario work created three alternate visions of the future. These are:

The Scenarios

- **BUSINESS AS USUAL**
- **MANAGED TRANSITION**
- **FREEDOM 2012**

OVERVIEW OF SCENARIOS

Business as Usual

*In "**Business as Usual,**" a series of market events and short term responses create a climate of investment uncertainty that prevents the system from evolving over time toward a fully competitive and well functioning electrical market in Alberta.*

In the short term additional generating capacity, spurred by the price spike of 2000/2001, comes on stream at the same time as a period of recession and weak economic growth in North America lowers natural gas and electricity prices. In Alberta, there is a growing perception that the electrical market is working well. Urgency for change declines. Issues concerning export/import connections and intra-Alberta transmission capacity are unresolved. There is opposition to export-dedicated generation that would add to local emissions without clear benefits for Alberta. There is uncertainty on how to finance and distribute costs for a major new north-south transmission line. There is a lingering concern about the government's decision to intervene and cap rates for small industrial, residential and rural consumers. In summary, there is uncertainty over export policy, intra-Alberta transmission expansion, government intervention on rates, continued concentration of generation capacity in a small number of companies and lurking concerns over Kyoto and Federal Government policy. Given this industry environment, investors become reluctant to commit capital to the Alberta market, and proposed generation investments are postponed or dropped.

The lack of investment has little impact in the short term with a sluggish economy and slow growth in energy demand. As the economy recovers and energy demand increases in North America, natural gas prices once again begin to rise. With prices determined by the marginal supply, there is upward pressure on electricity prices in Alberta. Small industrial and residential consumers, lulled into a sense of complacency by earlier rate caps and low electricity prices, are caught by surprise with the unexpected price rise. With new capacity proposed in 2002 through 2004 having been postponed or abandoned and with no additional import capacity, there is a supply crunch in Alberta, which leads to dramatic price spikes in electricity rates. The situation is volatile and the government is again forced to intervene and cap rates for consumers. The patchwork of regulators across the province adds to the complexity and confusion, particularly in the small consumer retail market. Uncertainty for investors is reinforced and there is little interest in investing or participating in a small, isolated and highly uncertain market such as Alberta. With a declining number of participants in the wholesale market, liquidity is undermined and in turn potential new retailers see few opportunities and huge risks in entering

the Alberta market. They are concerned that they will not be able to compete against the two large incumbent retail companies that dominate the market. They are also concerned about the uneven playing field created by the mosaic of different regulatory authorities across the province dealing with the retail and wires segments.

The result in 2012 is a restructured market, starved of private investment in generation and transmission, dominated by a small number of players at the generation and retail levels, facing volatile prices and increasing pressure for new regulation to control market power. Short term decisions, considered reasonable at the time, have not created the long term success desired with a restructured industry.

Managed Transition

*In "**Managed Transition**" an initial period of complacency followed by a price spike leads to a comprehensive and effective electricity energy policy. The policy emphasizes supply investment, consumption efficiency, enhanced environmental standards, market liquidity and market transparency to support well-functioning wholesale and retail markets.*

In the short term, slow economic growth limiting energy demand and gas prices, coupled with new generation capacity primarily from cogeneration facilities, leads to low and relatively stable electricity prices in Alberta. Despite the belief that the market is working well, there are initiatives to integrate Alberta with BC into a western RTO to encourage exports, imports and generation investment. This requires resolution of an export policy and increased physical interconnections to BC. The Alberta and US Governments and industry are able to resolve environmental concerns about export-dedicated generation facilities and set the stage for export and intra-Alberta transmission investment. The depressed electricity market, however, attracts little new investment.

With economic recovery energy demand in North America revives. Gas and then electricity prices rise rapidly. There is a public outcry and the government is forced to act. After a thorough consultation process, the government introduces a comprehensive electricity energy policy encompassing demand and supply initiatives. In the short term, investment in new generating and transmission capacity is encouraged through an accelerated planning and approval process that removes barriers and clarifies procedures without relaxing consultation or environmental requirements. For the long term, a variety of new supply sources from gas to coal to alternative fuels is encouraged. On the demand side, incentives for industrial and residential consumers are used to improve efficiency and increase the ability of consumers to manage demand, e.g., time of use meters. Adoption of other new technologies, encouraged by government, help the small consumer retail market to develop. All of these initiatives are developed within a market context and continued commitment to a competitive restructured electrical industry.

With increased external connections, Alberta is less isolated, thereby making "lumpy" investments less risky. With rising prospects there is investment in generation and transmission capacity. This enhances wholesale market liquidity and the potential for retail competition. The sale of municipally owned retailers changes the competitive landscape allowing new competitors to consider entering the Alberta market. Many of the new retailers are not traditional electricity

retailers but want to offer a bundle of services including electricity to consumers. Options for consumers expand including fixed and variable contracts, green power sources, fuel cells and solar panels. Some industrial users have bi-directional meters allowing them to sell surplus electricity back into the grid. The threat of such choices puts pressure on retailers to minimize costs, be more innovative and offer competitive products.

By 2012, the electrical system in Alberta has increased generation capacity, increased exports, developed more diverse sources of supply including coal, gas and alternatives fuels, expanded transmission capacity, improved wholesale liquidity and established greater competition and choice in retail markets. Restructuring has achieved a level of stability within a "managed" market context.

Freedom 2012

*In "**Freedom 2012**" a period of low prices and relative market stability allows the government to address barriers and impediments to a restructured and well-functioning competitive electrical system and minimize further government intervention. These occur in conjunction with developments in adjacent jurisdictions.*

In the short term, lower gas and electricity prices give the government breathing space to deal with a number of issues hindering the electrical system. A growing understanding of the integrated nature of the system is recognized. A series of issues are addressed: elimination of subsidies and credits and commitment to end consumer rebates and price caps; setting the parameters for developing new transmission capacity; privatization of government owned entities in the retail market; strengthening market surveillance to ensure ability to effectively deal with unacceptable participant behavior; eliminating the patchwork regulatory structure for the retail market and distribution system; expanding communication to ensure consumers are informed and understand how electricity markets work; and ensuring a seamless transmission system link with BC and the Pacific Northwest (RTO). These changes occur in concert with changes in BC to open their electricity market and in the US to strengthen open access transmission and support restructured competitive markets.

These changes provide a framework supportive of a market-based system. The government is able to minimize its involvement in the market. Markets begin to function efficiently with price signals being sent unimpeded by uncertainties created by sudden government interventions.

Business confidence increases. There is investment in generation and transmission. Clean coal technologies facilitate the acceptance of more efficient and more environmentally benign coal-fired power plants. Gas-fired plants also increase. Merchant generation plants increase and transmission investments reduce congestion in the major north-south corridor. Postage stamp transmission tariffs disappear. Export capability is expanded as Alberta becomes part of a larger integrated regional system. Supply is enhanced with the ability to import electricity.

The emergence of a regional market enhances liquidity and stability in the wholesale market. The forward market is active. In turn this supports a more competitive retail market. Aggregators and alternative retailers offering a range of bundled services and options emerge to provide consumers with choice. Time of use meters allow small consumers to manage costs by altering consumption patterns.

By 2012, investment in low-emission clean coal technologies, efficient gas-fired generators, alternative energy (wind, solar, biomass) and gradually emerging distributed generation technologies (fuel cells, micro-turbines) have significantly expanded generation capacity. The concept of net-metering to a greater number of customers fosters adoption of these new technologies. With greater capacity in intra and inter-regional transmission, Alberta has become part of a larger integrated system. This has contributed to competitive wholesale and retail markets. Informed consumers have accepted the cyclical nature of commodity pricing and industry players and customers have learned to respond to these realities and manage their supply planning, consumption and contracting.

Note: The Council again wishes to emphasize that the scenarios described above are not predictions, nor does the Council necessarily advocate any event, decision or outcome described in the scenarios.

The Scenario Process – What was Learned

- As events have unfolded since the start of restructuring, both the electricity and gas markets have stabilized, giving Alberta a period in which to resolve critical issues before difficult events occur.

- The highly integrated nature of the electrical system - so that any event or change in one part of the system usually has a significant impact on other parts of the system.

- The number and complexity of events that can have an impact on the system.

- The potential impact of external events and non-events increases the degree of uncertainty facing the system.

- The situation can change quickly with potential for adverse impact on the system.

- Short term decisions made or not made can result in outcomes that are significantly different than the desire outcome or vision.

- Scenario thinking clearly illustrates the importance of: a) anticipating these types of events, and b) evaluating possible responses.

- There is a sense of complacency – consumers and government are not sensitized to market volatility- there is potential for adverse change in the system.

- Prices are volatile across all scenarios - are Alberta consumers ready for this?

- *Coherent and comprehensive policy as context for* action is needed now to instill a sense of confidence on the part of market participants including consumers and investors.

- New technologies can be expected to have an impact on the electrical system - perhaps a 'disruptive impact' to existing vested interests and industry structures e.g. distributed generation, superconductivity and clean coal.

- Technology change must be encouraged to increase innovation and competition.

Key Findings - The Overarching Conclusions

- With the decline of electricity and gas prices from the high spikes in the early winter of 2000/2001, there is a feeling that the worst is over for restructuring. Indeed there is a growing feeling of complacency about the situation. Unfortunately the reality is that restructuring of the Alberta electrical industry is still at an early stage, and there is still a great deal of work to be done.

- All stakeholders must recognize and acknowledge that restructuring is in an evolutionary phase. The deliberations of the Council have convinced the members that this evolution will last for several years because of the number of major issues that must be resolved in order to enable **Vision 2012** to be achieved. Resolution of many of these issues will require long lead times.

- The issues that must be resolved are complex and highly interconnected. The Council stresses the integrated nature of the electrical system and the implications for policy development and planning for the continuation of the restructuring process. It is critical that a comprehensive plan be established which will account for the time span involved, and consider the electrical system from a holistic and 'systems thinking' perspective. Decisions made in isolation on any one aspect of the system may have unexpected consequences elsewhere in the system. These "linkage impacts" must be thought through and accounted for in resolving each issue.

- During the evolutionary phase of restructuring, there is considerable risk of experiencing major difficulties in the industry and its markets. This is in part because of the complexity of the industry and the highly interconnected nature of the issues involved in restructuring. More importantly, certain events are possible in the future that would threaten the industry if the critical issues are not resolved before those events occur. An example of such events would be a strong recovery in the economy causing an increase in demand for both electricity and gas which in turn could cause price spikes in both commodities.

- The Alberta electrical markets are currently in a "calm" period. This is **not** due to the restructuring of the industry. Rather it is due to an increase in electricity supply creating a surplus coincident with an economic slowdown further reducing demand for both electricity and gas, which has resulted in lower and more stable prices for both commodities. This "calm" period must be used to resolve critical issues as much as possible before threatening events occur.

- A strong, liquid and competitive wholesale market is the starting point and a necessary condition if the Alberta industry is to achieve **Vision 2012**. A strong, liquid and competitive wholesale market requires that Alberta have adequate generating capacity, transmission capacity to move the power to market efficiently and competitively, and an export/import capability to increase the available market size and provide increased supply availability of electricity when needed. These three requirements are tightly interconnected and ensuring that the requirements can be met raises each to the major issue level. Each of these issues are very complex and will require several years to resolve and have the necessary facilities in place. The Council called these three issues the "Foundation Issues" because it is clear that these issues must be resolved before many other issues can be addressed and before restructuring can really proceed to a successful conclusion.

- The Council observes that Alberta is capacity limited for the export/import of electricity compared to most of North America where much of the industry is connected with inter-tie facilities that allows electricity to move back and forth between numerous jurisdictions. If Alberta remains in this limited state, it will be much more difficult to resolve the foundation issues and to achieve an end state consistent with all the goals of restructuring the electric industry. Without stronger inter-tie capability, Alberta may have to secure an operating reserve in its supply base to ensure reliability. A constrained ability to export surplus power in the early years of a large generator investment will make it more difficult to attract investment to new generating facilities. The large reserves of coal in Alberta will also remain a greatly underused resource even when clean coal burning technology becomes available.

- The small consumer retail market is a specific focus of attention under the mandate for the Council. Deliberations by the Council strongly suggests that a functioning, competitive small consumer retail market is unlikely to develop until there is a strong, liquid and competitive wholesale market. Even with that condition, it will be challenging to develop a competitive small consumer market in the traditional sense in Alberta because the size of the market is relatively small. There is also an entry barrier unique to Alberta in the fact that the market is dominated by two relatively large incumbent retail companies. Another entry barrier is the mosaic of different regulatory authorities for distribution and retail markets that exist across the province. It appears now that this market segment will not likely develop until certain preconditions are put in place, including a

common load settlement agreement, a common billing system and a common regulatory administration across the province for everyone involved.

- Another factor slowing development of the small consumer retail market is that this consumer has not developed interested in the electricity market, and does not appear to be interested in learning about it. The small consumers will likely become interested with the next price shock or as real choices become available to them. However, it must be recognized that with the experience in Alberta (2001 price caps, 2002-2004 deferrals) and elsewhere (California, Enron), it may take some time before customers trust this industry to be governed by free market forces.

- To achieve **Vision 2012** and have a functioning electrical retail market for small consumers, it is necessary for those consumers to have options and choices for their supply of electricity. It is possible to provide choices in ways other than the number of electricity suppliers. One often touted way options can be made available is to have companies offering bundles of services such as telephone, TV Cable, gas and electricity. Another way will be through adopting new technologies to provide electricity, heating and cooling using distributed generation with micro turbines, fuel cells and geothermal heat pumps. New technologies could be applied to single homes or to community organizations to provide any number of homes. Awareness of these technologies and encouragement for their adoption must be developed. Only time will tell to what extent any of these concepts will gain wide acceptance.

- The Council concluded that it will take longer to develop a functioning small consumer retail market than most people seem to be anticipating at this time.

- It appears that many new technologies are becoming ready for application across most parts of the electrical system. Several technologies are becoming available for distributed generation, such as the fuel cell and micro turbines that can be used in commercial applications and even some industrial applications. Broader application of geothermal heat pumps for heating and cooling loads in all types of buildings can reduce demand for electricity and gas. There are enough new technologies being developed for applications related to the electrical industry that change could become disruptive to vested interests.

- The government must minimize intervention in order to build confidence that a market system will be allowed to flourish. At the same time, there remains an important and ongoing role for government relative to the electrical industry. Whatever the government chooses to do must be consistent, effective and balanced. The role of government at this point is to ensure that all the required policies and legislative framework/regulations are in place and then to encourage the continued evolution of the electrical industry toward a market based operation. The government role is clear in this regard because with all the issues still outstanding, restructuring cannot proceed on its own and arrive at **Vision 2012**.

The Council is concerned that the length of this evolution period may not be well understood and therefore the amount of work involved may be underestimated. Specific roles for the government are:

- During the evolutionary period, many issues will be resolved with many developments taking place across the system. The government needs to monitor these events to ensure progress is being made toward the goals and objectives in **Vision 2012**. If monitoring and discipline is not applied, the evolving trend could easily drift away from the objective.

- Throughout the evolutionary period market power could become a damaging issue through abuse. The government must establish a mechanism that protects consumers from the abuse of market power, and ensure the mechanism does protect the consumer.

- Sound guidance of the transition process will be critical because of the complexity of the issues to be dealt with and the time period that will be involved.

- The Department of Energy has a broad and heavy responsibility in many forms of energy that are important to the economy of Alberta. The Council is concerned that the Department may not be well placed to fulfill its ongoing role with regard to electricity. The Department should periodically examine its situation in this regard and take appropriate steps to ensure that it has the necessary skill levels to successfully complete restructuring.

Principles

Guiding principles considered by the Council to be fundamental to the success of restructuring include:

- Have patience – let the market work – understand the continuing role of government and execute actions in accordance with that role to minimize interference in the market and to encourage market efficiency.
- Minimize uncertainty in the industry environment – the government must clarify policy and regulations, by consistently making decisions in as timely a way as possible and by changing policy and regulations as seldom as possible.
- Communicate the government's commitment to these principles and demonstrate this commitment through its actions and as appropriate in its restraint of action.

Review of Other Jurisdictions – An Overview

A literature review was undertaken for the Council on restructuring experience in certain North American jurisdictions and some other countries. The review included articles from approximately the early part of 2000 to the middle of 2001. The study generated many observations, including the following:

- There are no jurisdictions that can be held up as "models" of best practices. Electricity restructuring is in its infancy in many parts of the world. Local and regional conditions inevitably play a role in the design and implementation of new competitive market structures. Some market reform decisions have been clearly destructive. However it is not yet clear what set of market reforms will lead to the best long-term results in terms of providing customers with the products and price choices they seek.

- Few jurisdictions have succeeded in sustaining a high level of consumer switching to competitive rates offered by retailers. In many jurisdictions, this is due to regulated rates being disconnected from the wholesale market, making it difficult for retailers to offer competitive rates. Competitive retail markets cannot function efficiently if they are de-linked from competitive wholesale markets.

- Jurisdictions that have focused on encouraging generation, rather than relying on attempts to manage the market, have had some success in keeping power costs relatively low.

- The goal of electric market restructuring should be to enable effective markets that provide for competitive prices and the services customers are willing to pay for.

- Government intervention has tended to distort markets, leading to delays in creating the signals required to encourage market solutions to problems.

- There are a number of models for handling congestion, including location pricing, and allowing the sale of transmission capacity rights. PJM and Australia have working merchant transmission models. Experience indicates that postage stamp pricing could lead to more congestion.

- The severe problems experienced in California arose when the State failed to deal with serious flaws in the original market design when they became evident.

STRATEGIC ISSUES

Definition of Strategic Issue

In keeping with its focus on both longer term and strategic issues, the Council prioritized the many issues using the following criteria in determining whether an issue is strategic:

An issue is considered to be strategic if:

- A decision results in a significant impact (magnitude).
- A decision is not easily reversed.
- It represents or is in integral component of the overall system or if a decision on this issue is needed before it is possible to proceed further on addressing other issues.
- If a decision is an important step in enabling the system to evolve toward **Vision 2012**.

The Council's Top Ten Strategic Issues

- **Generation** – is the underpinning of the electrical system; reliability and security of supply are critical essentials; long lead times are required for major new investments; policies and regulations must be set so that the market will invest in new generation as needed.

- **Transmission** – capacity is essential to move power to markets. If capacity is not available generation investment will not proceed; long lead times are involved in building new capacity; there is a need for a clearly defined process to deal with issues such as capacity, funding/ownership, tariffs, and regulatory and access rules. The policies and regulations should create competition between transmission and generation that results in the lowest overall cost.

- **Export/Import** – adequate interconnections to other jurisdictions contributes to security of supply; investors in new generation will almost certainly look for an ability to export excess capacity; a clearly defined process needs to be established to resolve this issue, and the process will be lengthy. Decisions on export capability will impact many aspects of the overall system.

- **Environmental Standards/Regulation** – a lack of clarity on emission standards in the future will contribute to uncertainty for investment in new generation and transmission. This issue is critical in the context of policy uncertainty in Alberta and Canada at this time relative to the Kyoto protocol.

- **Liquidity and Competition** – are essential in wholesale markets in order to have efficient retail markets – efficient wholesale markets are enabled by sufficient generation, transmission and export/import capability.

- **Market Power** – undue market power anywhere in the system will reduce investment and competition, causing rising prices and consumer dissatisfaction.

- **Retail Market** – a number of barriers exist which may impede or prevent the development of an efficient small consumer retail market. Where possible and fair, barriers to entry must be reduced for this market segment. Expectations on the pace of development for retail markets may be unrealistic.

- **Consumer Awareness/Education** – Alberta consumers have no experience with choice and evaluation of options in the electrical market; at this time the small consumer does not appear to be interested in the electrical market; awareness and education is required because informed consumer participation is critical to an efficient market.
- **Actions by Other Jurisdictions** – it is necessary to understand how changes in California's position (for example) on deregulation could impact on the plans for deregulation across other jurisdictions and ultimately the overall impact on Alberta. Restructuring of the electricity industry in neighboring provinces and the Pacific Northwest states would help Alberta achieve success with its restructuring.

- **Government Actions** – government needs to reinforce its stated objectives and commitment to electrical restructuring; government changing rules or intervening in the market must be minimized; and government must monitor progress to ensure that restructuring stays on track for its goals.

Issue Clusters

The Council, recognizing the inter-connectedness of the electrical system and the need to consider potential policy decisions and actions from a "systems thinking" perspective, linked the above strategic issues into three clusters. The three clusters are:

- **THE FOUNDATION ISSUES**

- **THE MARKET ISSUES**

- **INDUSTRY STRUCTURE ISSUES.**

The Foundation Issues

Background Discussion

A reliable electrical system operating at competitive cost is dependent first and foremost on three critical success factors: sufficient electricity generation, transmission capacity and the ability to export and import electricity. These three factors are highly interconnected. There are many issues to be resolved in each factor, these issues are interconnected by definition and together they form the foundation issues.

The building of significant generating and transmission facilities requires long lead times and very large investments. Investment decisions are always hampered by uncertainty, and long-term investments in generation and transmission are particularly vulnerable to uncertainty. Uncertainty must be minimized, that is, there must be clear policies and policy stability. Specific issues that are creating uncertainty for each critical success factor are outlined in the following sections.

Generation

Investment will not take place in large new generation facilities until investors and the money markets are certain that transmission capacity is or will be available to move the electricity produced at acceptable cost. Policy and regulatory stability must also apply to transmission availability and cost to provide as much certainty as possible over time.

A critical uncertainty affecting investment in generation is the environmental standards (including the Kyoto protocol) that must be met for new plants and that may be applied retroactively to older plants. Again policy stability is important in this regard.

Alberta is widely perceived to be limited in its ability to achieve import and export of electric energy as supply and demand fluctuates. A key factor in the economics of large new generating investments will very likely be the capability (both policy and wires) to export electricity excess to Alberta's needs in the early years of such investments.

Another important factor in generation investments is the capability to import electricity in times of supply shortages caused by emergency generator outages in Alberta. Some jurisdictions require as much as 20% reserve generating capacity. With a limited import capability, the generation and transmission system must be examined to determine what amount of reserve capacity is needed. The issues around reserve capacity should be the responsibility of an operating entity such as the Power Pool or the proposed ISO.

Government intervention to protect consumers is also a point of uncertainty. Intervention interferes with market signals and raises concern that government could intervene again at any time in the future.

Transmission

Transmission issues in Alberta are particularly urgent because new capacity is needed within Alberta and possibly for export/import capability to facilitate new generation investments. Resolving these issues will be breaking new ground in a restructured system. It is clear that this challenge goes beyond just existing regulation and requires new and modified policy.

In a restructured system, one of the important challenges is to ensure that transmission policies and regulations cause competition between generation location and transmission facilities to determine the lowest overall cost.

Transmission availability at reasonable cost is needed before large new generating investments can proceed. It is virtually certain that announced new generation investment will create congestion management problems in the existing transmission system. This raises issues such as who will pay, will existing generation face some reduction in their access to transmission, or will new generation be allowed access only to capacity left after the needs of existing generation are met?

Announced and proposed new generation capacity also raises the need to consider new transmission facilities. New transmission facilities will require long lead times to complete. This puts urgency into resolving issues such as who will build new facilities: will they be built and incorporated into the Alberta integrated system or will merchant facilities be possible and allowed? There is also an issue as to who pays. Will new generation that causes the expansion of transmission facilities be the only one to pay or will the cost be rolled into the Alberta system cost?

There are similar issues around transmission infrastructure required to increase the export/import capability. Who will build such facilities and who would pay for them? Should the infrastructure be paid for by only those who participate in exports and imports? Should the infrastructure cost become part of the overall Alberta transmission system cost? Is sharing of the costs and benefits possible or desirable? If the cost becomes part of the Alberta system cost, should an export/import tariff be applied to help offset the higher cost, or should they be merchant lines?

In all the transmission issues the question of the postage stamp rate system must be considered. Should it be changed to help overcome congestion problems? Would a change provide an incentive for new investment in transmission facilities?

For new transmission systems, there will be issues about rights of way to be resolved. How can new rights of way be secured, what new methods can be used to help this process? Environmental standards applied to new rights of way will also likely be an issue.

There is also the need to remain open to changes and improvements in regulatory practices. This includes consideration of new models such as Performance Based Regulation for regulated portions of the system. Further it means retaining the regulatory board to the requisite degree to

fairly and effectively deal with regulatory issues when and where required and in a timely fashion.

Export/Import Policy

The electricity export and import capability for Alberta is a major issue. As mentioned previously, Alberta is perceived as physically limited in its ability to import and export power. Should this be changed? There are strong arguments for change to increase the export/import capability. It would increase market opportunities for Alberta generation and help provide incentive for new generation investment. It would increase supply potential to the wholesale market, which would strengthen that market with more liquidity and competition. It may reduce potential need for expensive reserve capacity in the Alberta system. However there are those that would caution against expanding import and export capability. Their concerns must be adequately addressed.

If the export/import capability is to be increased a number of other issues are raised. There is the transmission infrastructure issue outlined under Transmission above. It is highly probable there will be a need for public consultation on an export/import policy or position. There will be a need to negotiate with other jurisdictions to accept export/import capability with Alberta with all that may mean for facilities and other impacts on those jurisdictions. Further, to facilitate competitive energy markets it is imperative that there be common business practices on the transmission system to avoid rate pancaking and other "seams" issues. Alberta's participation in the forming Regional Transmission Organization (RTO) in the Pacific North West must also be carefully reviewed and decided upon.

The possibility of increased export capability will almost certainly raise the question of export dedicated generation in Alberta. This will bring in issues such as what are the costs of export dedicated generation and what are the benefits for Alberta.

In summary, the issue of export/import capability must be addressed because this issue has a very strong influence on the matters of generation, transmission and the wholesale market.

Impacts of Not Addressing the Foundation Issues

There are many negative implications but the key impacts are:

- **Insufficient and untimely investment in generation and transmission.**
- **Greater potential for brownouts/blackouts.**
- **Opportunity for market power abuse.**
- **Lack of wholesale market liquidity.**
- **Higher and more volatile prices.**

Recommendations

It is important to develop and put in place as early as possible and on a priority basis a framework of decisions, policies and regulations that will allow the market to bring about resolution of the Foundation Issues.

Generation
- Resolve transmission and export/import issues.
- Establish environmental standards for new generation plants and stabilize the standards with inter-jurisdictional agreements as appropriate.

Transmission
- Develop on a priority basis the policies and regulations that will enable the market to meet transmission requirements.
- Evaluate participation in a regional transmission organization.

Export/Import
- Embark on an immediate public consultation process to identify and resolve concerns including the question of benefits and recognition of potential environmental implications.
- With Albertans' input, establish and communicate the Government's position on expansion of the export/import capability for the province.

Market Issues

Market Power

An efficient market is one that is responsive to price change, that is, supply and demand respond in a timely way to market price signals. Efforts to create well functioning electricity markets have not yet been fully successful in the restructuring of electrical markets around the world. Alberta is breaking new ground with few workable models to follow. The evolution of the markets in Alberta, both wholesale and retail, will therefore have to be monitored carefully to ensure they are developing toward efficient markets that will provide competitive prices.

Competition is typically ensured by having multiple players acting independently so that market power abuse is less likely to occur. However, market power can develop and be abused at any time in a market, particularly in a small market with few competitors. Alberta therefore does have risk for market power abuse in both the wholesale and retail markets.

This risk must be guarded against, and for this reason the role of the Market Surveillance Administrator becomes an important part of the structure for the markets to reach **Vision 2012.** The Competition Bureau of Canada recently released their *Written Comments of the Competition Bureau to the Alberta Electricity Industry Structure Review* (February 15, 2002). A key conclusion in the Bureau's comments is "that there is a strong need for market surveillance not only of electricity market participants, but also of the related institutional framework and market rules." ACE agrees with the Bureau, and believes that clear market rules are critical to the successful operation of the surveillance function. Two major areas are of immediate concern.

Firstly, clear rules are required around economic withholding and physical withholding in the real time market. Secondly, long term holding restrictions for the whole market need to be established.

Clear rules and guidelines around physical withholding and economic withholding are required. Some members of the Council support the definition of strictly defined circumstances under which participants would be in violation of the rules. Their argument is that market participants need such rules in order to know what strategic behavior is acceptable, and the MSA needs rules to aid in its enforcement role. Others feel that broader guidelines may be appropriate with the MSA defining acceptable/unacceptable behavior by investigation of specific incidences and establishing precedent by having the Power Pool council levy a fine or sanction. Regardless of what approach is taken, ACE believes that Alberta must be proactive and develop clear rules which will provide the correct signals to the market and increase confidence in the market from the perspective of both supply and demand.

Long term holding restrictions are required to ensure that market concentration does not occur which could lead to the exercise of market power. Recent announcement by some generators has magnified the urgency of the need to establish long term holding restrictions proactively. Analysis by London Economics, Charles Rivers, and comments by the Competition Bureau all point strongly to the need for restrictions on the market as a whole. London Economics' recent analysis of the competitiveness of the Alberta market, carried out for the Balancing Pool, suggests that there is a significant opportunity to engage in strategic behavior affecting the spot market price if a participant controls more than 15% of the generation market. London Economics' conclusions are in fundamental agreement with those of Charles Rivers, prepared for the IAT process.

The potential for concentration of generation ownership in Alberta is of serious concern and should be dealt with proactively. To delay the implementation of restrictions until such time as players have increased their position beyond an acceptable level is not fair to those players. Rules must to be set out in advance of the need for them, in fairness to all participants. Energy companies looking to take a generation position in the Alberta market are concerned with the dominant position of a few existing players. Long term holding restrictions will encourage new companies to enter the Alberta market.

All of the foregoing is extremely important for its repercussions and consequences in the wholesale and retail markets. As stated earlier, the retail market may not develop as quickly as expected but anything which might bolster the end consumer's faith or trust that the market is immune from manipulation is advantageous.

Wholesale Markets

Sufficient liquidity and competition are key conditions for an efficient wholesale market with minimum opportunity for participants to establish market power. Alberta has a good start toward an efficient wholesale market given the short time frame the market has existed, and also relative to other jurisdictions which have been at it longer. However, much more progress is needed to safeguard what has been accomplished and reach a mature market stage. The further

developments outlined in the Foundation Issues section are critical for the wholesale market to make that progress. Given the potential for market power abuse, it is critical for the government to establish a framework of market rules and an effective market surveillance and enforcement process to ensure the functionality of this market.

Retail Markets

It will be very difficult to establish a well functioning retail market[1] without a liquid and competitive wholesale market. The retail market has not progressed as quickly as the wholesale market and in reality is not yet an established market. This is particularly true for the small industrial, residential and rural consumer, while the large industrial consumer can in fact be a wholesale customer. The slow pace is not surprising, as the retail market cannot really develop until the wholesale market development is well along, and several other conditions develop for this market. A significant problem for consumers, both industrial and residential, is an inability to manage electrical costs. The small consumer does not have tools such as real time metering to help with management of costs.

The retail market in Alberta is sufficiently small as to make it unlikely to attract a number of retail companies. This means that developing an efficient retail market will be a challenge because we likely will not see a number of retailers in the market. Alternative means to give consumers choice and get competition in this market segment will have to be developed. One possibility is competition with bundled services that could include electricity, natural gas, TV cable, security services etc. However, this bundling concept has not developed at the pace expected at the start of restructuring. Technology can also provide choices over time with availability of real time metering, distributed generation and geothermal heat pumps. It will be important to encourage these technology developments in Alberta.

In addition to the small size of the Alberta market, there are a number of other barriers that will make it difficult to develop competition in the retail market. These include:

- Fragmented regulation of the distribution (wires) system.
- Concentration of small retail consumer market power in the two incumbent retail companies.
- Risk management capabilities are developing in the wholesale market and will take time to move down to the retail market.
- Government intervention with price caps and Regulated Rate Options have raised concern about possible future intervention.
- Generic barriers such as costs and lack of economies of scale in a market of just over 1 million customers.
- External happenings such as other, larger markets opening and drawing investment to those markets.

1. The retail market is considered to have three parts: large industrial and commercial, small industrial and commercial, and residential and rural. The Council considers that the large industrial and commercial market segments are really part of the wholesale market.

Impacts of not Addressing the Market Issues

Again there are many negative implications for the markets, but the key impacts are;

- **The wholesale market may weaken and not continue its development into a liquid workably competitive market.**
- **An efficient, competitive retail market does not develop.**
- **Higher risk of market power abuse.**
- **Higher and more volatile prices.**
- **Minimal choice for small retail consumers.**
- **Economic development in the province is discouraged.**
- **The small retail consumer becomes frustrated with the complexity and or cost of electrical service and angry with the retailers, or the government for embarking on restructuring.**
- **Growing support for re-regulation of the retail market.**

Recommendations

- Address the Foundation Issues so there is a strong wholesale market to support the retail market.
- Consolidate the regulation of the distribution system (wires) and the retail market under one provincial regulatory administration applied equally to all players.
- Minimize entry barriers in the retail market.
- Put in place clear definition of anti-competitive behavior and requirements for market participants to mitigate market power.
- Establish an effective market surveillance process with a clear set of guidelines and rules, and a strong enforcement authority.
- Encourage development of demand management capabilities with time of use metering.
- Encourage development of choices over time for the small consumer, which may include bundled services and new technologies.

Industry Structure and Roles Issues

Structure and Roles

The restructured industry is now in place and operating, but progress in the various segments has not been even. This is entirely to be expected in the evolution of restructuring a market, but the system must continue to move toward **Vision 2012**.

Prior to January 1, 2001, a number of new organizations were put in place and began to operate to test their functions. On January 1, 2001, the industry was formally reorganized and all the

parts began to operate in the restructured mode. While the restructured system is now operating, the early experience indicates that some changes are appropriate. This is to be expected with a major restructuring that had no successful model or experience to follow.

Clearly the functionalization of the industry has been a success. There are four sectors split along functional lines, Generation, Transmission, Distribution and Retail. The greatest challenges have been in the areas between these functions or in the new stand alone functions that were previously part of the integrated utilities. This includes Power Pool governance and rules, market surveillance, the TA and system controller roles and responsibilities, settlement systems and retail market issues.

In order to move the restructuring forward to the goals of **Vision 2012**, the structure of the new system and the roles of the various organizations operating in it need to be examined periodically. A number of studies are underway to review various parts of the structure. This work should be done with dispatch, but it must always account for the interconnected nature of the system. It must also always be done with the **Vision 2012** goal in mind.

Another key factor in making adjustments to the structure is to always ensure that mandates and roles are clearly defined so that there are no gaps or overlaps in responsibilities. Unless this definition is done carefully there will be tasks left unattended and confusion and uncertainty will result in the market.

Consumer Awareness and Government Communication

Prior to January 1, 2001, the electrical industry and its services was one that the consumer did not have to think about. The consumer had one choice to make, and as a result the consumer learned very little about the industry and took it for granted. No consumer in Alberta had any experience with a deregulated and restructured electrical industry until after January 1, 1996 and actually not until after January 2001 for most customers. Even then the RRO and price caps shielded the residential, rural and small commercial consumers from the restructured market.

With restructuring, the consumer can no longer take the industry for granted. For restructuring to work for the consumer, the retail market must offer options, and the consumer has to learn how to evaluate options and make choices. However, it appears to the Council at this time that the small individual consumer is not interested in the market, and is not interested in learning what it means and how to operate in it. As a result of the next price shock or as choices develop in this market, the small consumers may become interested. They will then have to learn how to evaluate options and make decisions that are right for them. It is important that a communication program be put in place to raise awareness of consumers about this new market rather than to let events do it with a shock treatment.

As consumer awareness increases, a consumer education program is required to help the consumer learn more about the industry, the choices that are available and how to work out the decisions that must be made. **A knowledgeable consumer, willing and able to participate in the market, is essential for the retail market to develop into a competitive, efficient market.** This outcome in turn is critical if **Vision 2012** is to become a reality.

Environmental Standards/Regulations

Environmental standards and regulations will contribute to uncertainty for investment. These standards and regulations must be clarified and be as stable as possible. Stability means that there must be agreement within Canada on these standards between federal and provincial authorities. This is a major and vital task at this time because of the policy uncertainties created by the Kyoto Protocol and the decisions that must be made about that protocol by Canada, each individual province and especially Alberta. Until this policy field becomes more settled, the uncertainty will likely have a considerable adverse affect on investment in Alberta.

Greater Credibility in Government Communications and Actions

Achieving **Vision 2012** will not happen by itself after setting restructuring in motion. The government must continue to demonstrate that it intends to see restructuring through to its conclusion. The clearest signal of the government's intentions is for the government to play the roles that have been outlined for it in this report. Perhaps the most important and fundamental role of the government is to set policy framework guidelines for the markets, institutions and regulatory agencies. It will also be important to be visible, continuously monitor the restructuring process and nudge it in the right direction if it appears to be drifting. Another very important signal is for the government to be patient and let the market work, and to do so by intervening in the market as little as possible.

Restructuring in Other Jurisdictions

Industry restructuring in other jurisdictions needs to be closely monitored. In response to the California experience and the Enron situation, many American state governments may re-think their plans for electrical restructuring. This could create a negative image around restructuring that would be troublesome for those jurisdictions that plan to continue with restructuring such as Alberta.

Developments such as the Enron collapse could also influence the way that energy markets – particularly electricity markets – function in the future. It will be important to ensure that Alberta's electricity markets are designed to adjust to changes in trading and other market practices, whether voluntary or imposed by regulation and accounting rules.

Further the development Regional Transmission Organizations (RTO) and the FERC activities with respect to a Standard Market Design (SMD) need to be closely followed and the implications for Alberta understood. Accordingly, Alberta should become proactive with regard to restructuring in other jurisdictions, especially those jurisdictions close to Alberta. Restructured jurisdictions could more easily cooperate with one another and help overcome problems such as the small size of the Alberta market.

Impacts of Not Addressing Structure and Roles Issues

- **Restructuring does not improve with experience, the industry is more inefficient and costly than it should be.**
- **Environmental regulatory uncertainty delays or inhibits investment.**
- **Consumers remain uninformed and have unrealistic expectations.**
- **The uninformed consumer does not participate in the market and the retail market does not develop.**
- **The small retail consumer becomes frustrated and angry about their lack of knowledge and inability to deal with the electrical market and blames the retailers, and more importantly, the government for the situation.**
- **Alberta lags behind in restructuring, including not participating in an RTO type organization with the result that the benefits of participating in a larger market are foregone.**

Recommendations

- Government to take a leadership role to ensure that restructuring continues through its evolution to arrive at **Vision 2012**.
- Government and industry to cooperate in developing a consumer awareness and education programs and seeing that it is implemented.
- Government to maintain its efforts to try and develop understandings and clarity of environmental regulations with the Federal government and other provinces.
- Government to continue to clearly and effectively communicate its intention that restructuring will continue to its successful conclusion.
- Government demonstrates patience with market development and does not intervene.
- Government and industry to work together to encourage restructuring in other jurisdictions, especially those close to Alberta.

Appendix A

VISION 2012

One of the very early items the Council worked on was a "vision" of what form the electricity industry would be in and how it would be operating at the end of the period the Council was to consider, based on the assumption of successful restructuring over that period. The Council reviewed the vision put forward in 1999 by the Department of Energy (Vision 2005). The Council decided that the Vision 2005 document represented directionally a state that the Council thought should be achieved by the industry with successful restructuring.

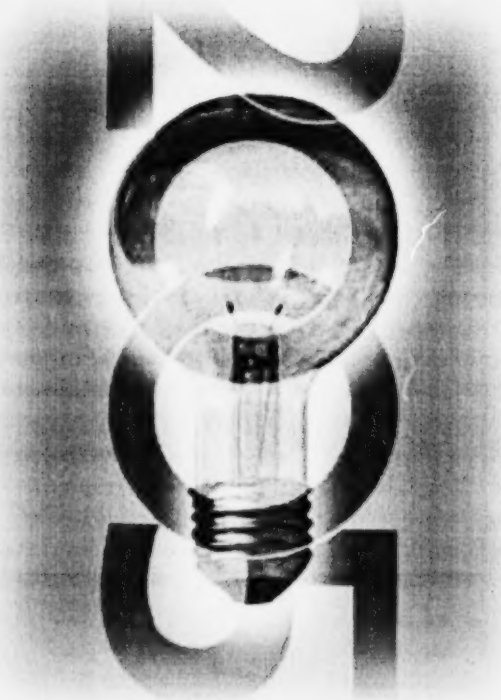
On this basis the Vision 2005 document forms a more comprehensive vision statement as the foundation for the more condensed **Vision 2012** used by the Council for its deliberations.

The full text of the Vision 2005 document follows.

Appendix A

LOOKING AHEAD TO 2005

A Vision for Alberta's Electric Industry



Agencies involved in the transition to a competitive marketplace define their vision and expected benefits for Albertans.

Consumers Are Benefiting

- Strong competition among retailers for customers continues to put downward pressure on rates. Consumers are finding that they can get better rates from competing retailers than they would have received in a regulated system.
- Consumers understand how the marketplace works. They are well informed about the choices and opportunities available to them.
- Home, farm and small business consumers who initially chose to stay with their existing supplier on a regulated rate in order to become familiar with the new marketplace have now chosen a retailer. There is little or no interest by consumers in a regulated rate as lower, stable rates are now offered by the marketplace.
- Large industrial and commercial consumers are benefiting from new market opportunities: they can now make their own retail supply arrangements and they can build an energy supply portfolio from competitive offerings.
- There is a new era of choice and services for consumers. Electricity marketers are providing valuable services in ways not conceived of before restructuring. These advances have been made possible through new technologies. Technology is an "enabler" in the industry, as the market has been freed up to encourage innovation.
- Advances in telecommunications and other areas have positively affected the electricity market. For example, public data networks, smart technologies for controlling power, convergence of many utilities (e.g. one-bill service), and other advances have been developed.
- Consumers are effectively managing their own energy costs. They have a heightened awareness of conservation and many consumers are selecting "green power" suppliers.
- Investments in new generation are in sync with the needs of a growing population and thriving industry.

The Marketplace Is Competitive and Healthy

- By the year 2005, there are many market players, including retailers and generators. A level playing field exists for all market competitors. Systems are in place to handle the entrance of new players.
- There is a thriving market of direct sales between buyers and sellers, as well as a competitive Pool spot market for wholesale power.
- The long-term power supply arrangements applied to previously regulated generation fit well within the overall competitive system. The objectives of mitigating market power and ensuring that Albertans continue to benefit from the low-cost power built under regulation have been met through these arrangements. Utilities have not found themselves with unrecoverable costs. A secondary market for trading these arrangements may have developed.
- All markets are functioning well and new ones are developing in areas such as emissions trading. Buyers and sellers are confident enough to make financial commitments in day-ahead, week-ahead and year-ahead deals.
- The Pool price reflects the commodity market and there is liquidity in the market.
- Correct market signals are being given for a competitive environment.
- Businesses in the industry are viable and shareholders are happy. Companies are increasing their earnings and businesses are growing and expanding into other regions.

Industry Support Systems Are Streamlined and Effective

- Roles, relationships and responsibilities of various agencies supporting the industry and the competitive marketplace are clear and common standards have been developed.
- The transmission system is well-managed for the benefit of consumers and industry. There is good, open access with British Columbia and Saskatchewan, including good interfaces. There is reliability and security of supply.
- System support services were well-provided during the transition and risk management factors were incorporated into transition systems. Unnecessary transmission investment was avoided.
- The Market Surveillance Administrator is effective and vigilant. As the market evolves, the necessity for the role has diminished as there are few, if any, concerns about anti-competitive behaviour
- The streamlined regulatory system enables industry to be effective and innovative. Industry stakeholders are working together to resolve issues. There have been few, if any, hearings. regulatory costs have been significantly reduced.

A Vision for Alberta's Electric Industry

Dramatic changes are occurring world-wide in the way power is generated and sold. To ensure that Alberta is ideally positioned to take full advantage of new technologies and innovations, the Government of Alberta is taking a leadership role in restructuring the province's electric industry.

Restructuring and deregulation began in Alberta in the mid-1990s. The transition to a competitive marketplace takes time and requires a clear vision of the end goals. This document looks ahead to the year 2005. It helps to define the Government's vision of a competitive marketplace and the benefits to Albertans.

In mid-1999, the Department of Resource Development, the Alberta Energy and Utilities Board and independent agencies (i.e., the Power Pool of Alberta and the Transmission Administrator) met to discuss their vision for the industry. They identified a number of goals that capture the effective and efficient operation of the competitive marketplace. This document captures the vision from the perspective of the Department and independent agencies, and defines the expected benefits for Albertans.

A snapshot of the year 2005

a competitive, efficient and innovative electricity marketplace

new generators and many new service providers

informed consumers choosing from competitive, attractive options

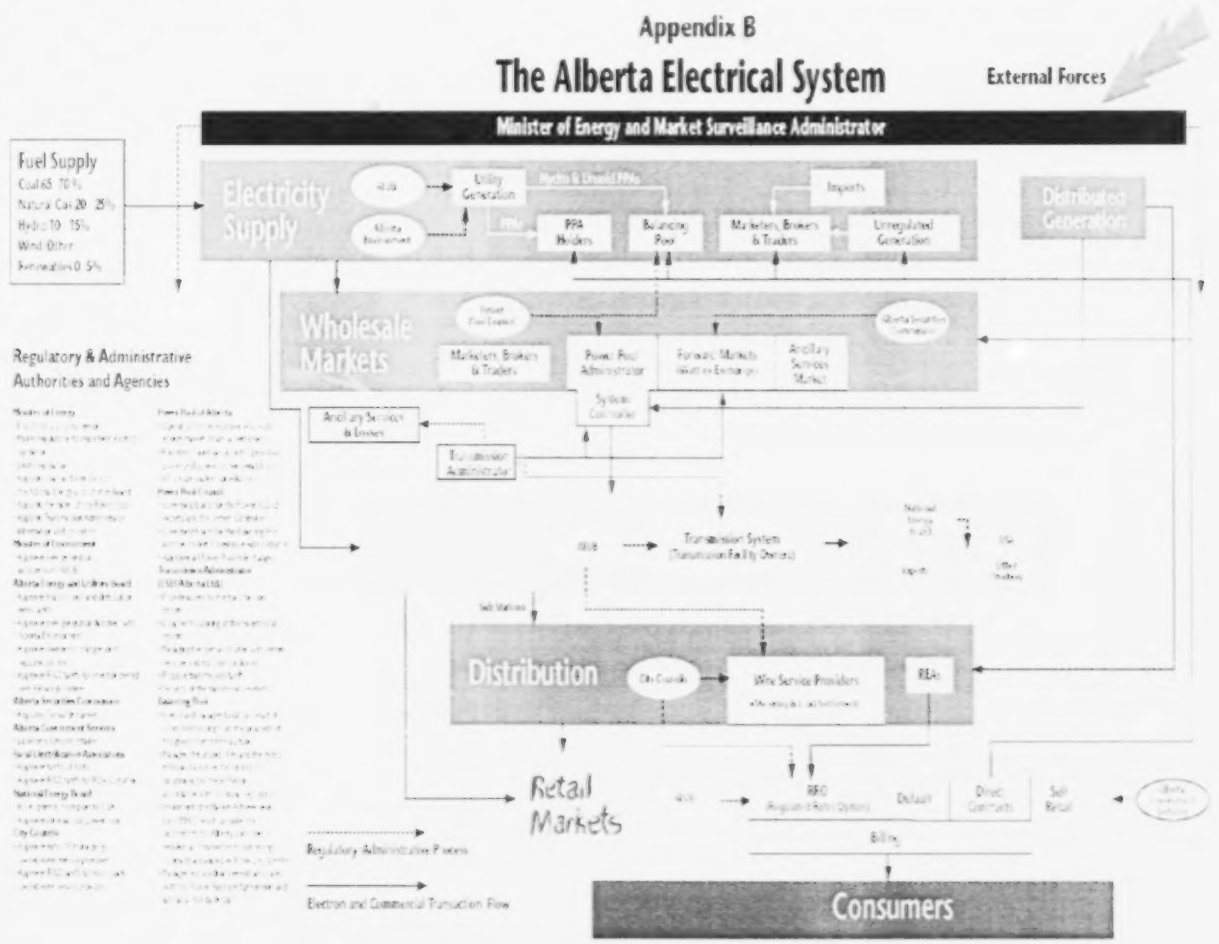
continued downward pressure on rates

incentives for conservation and the wise use of energy

smart technologies and green power options that contribute to environmental goals

Appendix B

The Alberta Electrical System



APPENDIX B

Appendix B
The Alberta Electrical System
External Forces
Minister of Energy and Market Surveillance Administrator
Fuel Supply
Coal 63 - 70 %
Natural Gas 20 - 25%
Hydro 10 - 15%
Wind/Other
Renewables 0 - 5%
Electricity Supply
AUB
Utility Generation
IPPs
Hydro & Unsold PPAs
PPA Holders
Balancing Pool
Imports
Marketers, Brokers & Traders
Unregulated Generation
Distributed Generation
Wholesale Markets
Power Pool Council
Marketers, Brokers & Traders
Power Pool Administrator
System Controller
Forward Markets (Watt ex Exchange)
Ancillary Services Market
Alberta Securities Commission
Ancillary Services & Losses
Transmission Administrator
Transmission
AUB
Transmission System (Transmission Facility Owners)
National Energy Board
Exports
USA
Other Markets
Sub Stations
Distribution
City Councils
Wire Service Providers
REAs
Retail Markets
AUB
RRO (Regulated Rates Option)
Default
Direct Contracts
Sell Retail
Billing
Alberta Government Services
Consumers
Regulatory & Administrative Authorities and Agencies
Electron and Commercial Transaction Flow
Regulatory/Administrative Process
Notes: 1 This "map" is an approximate representation of Alberta's electrical system, and has been developed to illustrate inter-connectedness of the system
2 Developed by GBN Canada & INTENCO Energy Consultants for the Alberta Advisory Council on Electricity
September 2001

Appendix C

The Alberta Electric Industry – A Short History

The deregulation or restructuring of the Alberta Electric System commenced with passage of the ***Alberta Electric Utilities Act*** (EUA) in 1995, and the first changes under that Act took effect on January 1, 1996. Further revisions were made to the restructuring via amendments to the EUA in 1998. Most of these took effect in the time between late 1998 and full implementation of restructuring on January 1, 2001.

Until December 31, 1995, the Alberta system had evolved to become one integrated system dominated by three vertically integrated utilities; Alberta Power Ltd. (APL), now ATCO Electric Ltd. (AEL), TransAlta Utilities (TAU) and Edmonton Power, now EPCOR. Vertical integration meant that each company owned all facilities and was responsible for generation, transmission, distribution and retailing of power within defined service areas where they had an exclusive obligation to serve. TAU and APL were investor owned public utilities, which in turn were regulated by the Alberta Energy and Utilities Board (AEUB). Further, at the distribution level there were other municipally owned distribution systems most notably the City of Calgary owned system now called Enmax, and the cities of Lethbridge and Red Deer. Rural Electrification Associations or REAs served many customers in rural areas. The City of Medicine Hat owned both generation and distribution assets to serve its residents. The REAs and the municipally-owned utilities were regulated by their owners, either local government councils or board's of directors in the case of the REAs.

The transmission system of the province had been operated as an integrated system since 1974. At year-end 1995, the Alberta system had two transmission interconnections with neighboring provinces, British Columbia and Saskatchewan. There were no direct interconnections between the Alberta Integrated Electric System (AIES) and the United States.

A significant development in terms of the future restructuring of the province's electric system occurred in 1985 when the Province of Alberta sought to address the problem of growing rate disparities between service areas through the creation of the Electric Energy Marketing Agency or EEMA. EEMA developed a mechanism to average the generation and transmission costs of the integrated utilities so all utility customers in Alberta, regardless of location or provider, paid an EEMA average price. This mechanism was regulated by the AEUB. The vertically integrated utilities carried out the role now commonly referred to as system controller on a shared basis.

By the early 1990s, the EEMA system of cost averaging was under strong threat of breaking down. With the full support of its customers, TransAlta, which was paying into EEMA, was putting strong pressure on the government to abolish EEMA on grounds that it was a disincentive to the most cost-efficient utilities. TransAlta also attempted to circumvent EEMA through an RFP for independent power generation. This also helped to win support from independent power producers for fundamental changes in EEMA. Beneficiaries of EEMA,

largely in northern Alberta, strongly resisted any change that would undermine the rate equalization formula.

Facing a serious policy dilemma of how to change EEMA without creating major north-south divisions in the province, the Alberta Government struck a multi-stakeholder committee to make recommendations. In the fall of 1994, the committee recommended restructuring the system based on the model of a power pool, similar to the bid-offer pools in the United Kingdom and the State of Victoria, Australia.

But while stakeholders agreed that new generation should be deregulated, they could not agree on how to deal with existing regulated generation. The basic issue of disagreement was who – consumers or shareholders – should capture the stranded benefits of existing generation, and for how long. Pending resolution of this issue, the EUA of 1995 effectively grand-fathered EEMA through a system of legislated hedges between regulated generators and distribution companies, which assured that customers would continue to receive the benefits of the low embedded cost of existing generation in the province, while generators recovered the fixed and variable costs of existing regulated generation. The Act recognized the need to deal with this issue, either by stakeholder consensus or by unilateral government action.

Other changes implemented by the EUA were as follows:

- Exempt Medicine Hat from restructuring.
- Reorganize the vertically integrated utilities along the lines of Generation, Transmission and Distribution as separate functions but without any forced divestiture.
- Retain regulation over Wires, both Transmission and Distribution.
- Allow new Generation of power to be de-regulated.
- Create the Power Pool of Alberta, responsible for the operation of an independent, fair, open and efficient market for the exchange of electricity and the safe, reliable and economic operation of the interconnected electric system.
- Allow market forces (supply and Demand) to set the price of power traded in the Power Pool.
- Create a Transmission Administrator or TA to provide open access to the grid. (However, transmission was treated essentially as an incidental issue in this legislation).
- Other.

By 1997 it became apparent that the market – skewed by the existence of the legislated hedges – was not providing the signals to build new generation. There were unresolved issues around three interrelated concerns:

1. **Market Power:** - one player, TAU, held the majority of the generation capacity in the province and this was of concern to industry participants because it could allow for the exercise of market power by TAU as a generator.
2. **Residual Value:** (or stranded cost) – Consumers argued that the pre-existing generating plants were paid for through customer rates in a regulated environment. Regulation allowed that some of the value of low cost plants should continue to flow

to customers. But some stakeholders countered that the residual value should accrue to shareholders.

3. **Customer Choice:** How to allow customers at all levels to be empowered in the new market by the exercise of choice.

The 1998 Amendments to the EUA were made to implement corrective measures around these three issues. With stakeholders still grid-locked, the government decided that the residual value of regulated generation should accrue to consumers for a period of twenty years, or the remaining life of the units, whichever comes first.

Market power and residual value concerns were handled by implementation of Power Purchase Arrangements or PPAs. An Independent Assessment Team was created to design the PPAs based on the government's criteria. A PPA auction was held in August of 2000 to sell the output of existing plants into the market. There were holding restrictions on the auction so no one party could be in a market power position. The ownership of the physical plants remained with existing owners, TAU, AEL or EPCOR, and the output reverts to the owners after the end of the PPA terms. The sales proceeds were returned to customers as residual value payments through a Balancing Pool or BP.

Not all of the generation output was sold in the first auction. The government decided that the output that did not sell in the first PPA auction, including offer rights, would be held by the Balancing Pool. This created a new set of problems, and led to claims that the government was intervening in the market. The energy associated with the unsold PPAs, but not the offer rights, was subsequently sold in a second auction in December 2000, known as the Market Achievement Plan, or MAP I. A third series of auctions, known as MAP II, is planned for the latter half of 2002. MAP I sold all of the Balancing Pool (BP) held power for 2001 and a portion of the BP power for 2002 and 2003. For 2002 the BP holds the remaining output of the plants until MAP II is completed, MAP II will sell power for varying periods from portions of the power plants.

Customer Choice implementation consists of allowing customers to purchase electric power from licensed retailers. The power is delivered by the transmission and distribution system as a common carrier. The terms of retailer relationships with distribution companies or Wire Service Providers (WSPs) are also an outcome of the 1998 amendments to the EUA.

Another outcome of the 1998 EUA amendments was a form of default rate for small customers who did not choose a retail provider. Firstly, incumbent WSPs were mandated to have an affiliated retailer or a designated default rate provider. The WSP or its designate would offer default rate for eligible small customers. This was called the Regulated Rate Option Tariff or RROT. In order to have in place a default rate for January of 2001, WSPs negotiated purchases of power on behalf of their customers. The respective regulators approved these purchases- Municipal councils for Municipally owned WSPs and the EUB for investor owned WSPs or their designate.

In late 2000, there was a serious price run up in market based electricity prices in western North America, precipitated in large measure by a rapid increase in natural gas prices,

exacerbated by a drought in the Pacific Northwest, by hot weather in California, and by flaws in California's market design. Alberta electricity distributors were purchasing power at prices higher than they were charging in the rates to consumers. The distributors applied to pass on these increases to customers. In November of 2000, the government prohibited the recovery of these deferred charges until 2002 at the earliest. Further in November of 2000, the government capped the RROT electricity rate at $.08 (eight cents) per kWh. Subsequently this cap was raised to $.11 (eleven cents) per kWh. This rate freeze and delay of deferral account collection added significantly to the challenges in understanding the changes in the roll out of restructuring on January 1, 2001.

Through the year 2001, the EUB conducted an extensive hearing process to determine the fairness of the deferral account charges from year 2000. This process was finalized by early in the year 2002. These deferral account amounts are now collected as rate riders on 2002 - 2004 electric utility bills. These amounts are collected as part of the wires charges so all customers are paying under the riders regardless of energy supplier.

The challenges that face the system in mid 2002 are numerous. They include the reopening of the EUA to implement structural changes to the entities of the Power Pool and Transmission Administrator (TA), determining how to manage impending congestion issues in the transmission system, and also to incorporate many changes that were made to the EUA by various regulations. Additionally, a number of industry committees continue to work on fine-tuning the many processes that have been implemented with change. Lastly, while this is being done, attempts are being made to develop an environment where retail competition will mature and grow.

Appendix D

A Review of Worldwide Electric Restructuring

and its Relevance to Alberta

Prepared for the Alberta Advisory Council on Electricity

November 2001

David Butler and Associates Ltd.

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INTRODUCTION

The following report is organized into four sections: 1) The first section summarizes the restructuring of about a dozen jurisdictions around the world. Each summary shows the Red Index ranking if available, contains a review of various market products available and discusses some of the market issues facing each jurisdiction. 2) The next section reviews the conditions and polices which have led to effective and ineffective markets. This section includes a discussion of policies which may be relevant to Alberta. 3) Then there is a one-page summary of proposals that the Center for the Advancement of Energy Markets believes will help Alberta improve the policies it currently employs to create an effective retail market. 4) Finally a glossary of a few terms has been added.

This document is based on six publications. 1) The "Red Index" published by the Center for the Advancement of Energy Markets is a useful measure of the attributes required to create an effective retail market. 2) The "London Economics Interjurisdictional Reviews" provides reviews of a dozen markets describing each market with a discussion of the issues facing each jurisdiction with comments relevant to Alberta. 3) The "Wholesale Markets Companion Study" published by XENERGY presents an excellent overview of the market flaws and barriers that exist in the Northeastern electric markets as identified by retailers to have the greatest impact on competitive electric retailers. In addition the report summarizes what is being proposed to overcome these problems. 4) The "State Restructuring Briefs" published by XENERGY provides a great deal of information regarding what has happened and is happening in several states. 5) The "Role of Vibrant Retail Electricity Markets in Assuring that Wholesale Power Markets Operate Effectively" published by London Economics reviews issues facing retail markets. Finally, 6) "Beyond California's Power Crisis: Impact, Solutions, and Lessons" published by the Cambridge Energy Research Associates assess the California power crisis. In addition several documents on the IMO website have been referred to.

The intention of the report is to review some of the successes and failures of other jurisdictions to provide insight regarding best and worst practices employed in the restructuring of other markets.

EXECUTIVE SUMMARY

Alberta is #1. According to the Red Index published by the Center for the Advancement of Energy Markets, updated in July 2001, Alberta was ranked first among all the states and provinces in North America in progress made establishing policies that are essential to the development of retail energy competition. However, few jurisdictions that currently provide regulated retail rates have had a sustained high level of customers switching to competitive rates offered by retailers. Wholesale rates in many jurisdictions have increased for various reasons while regulated rates have not been increased to reflect the realities of the wholesale market. This has made it difficult for retailers to offer competitive rates.

The following summarizes six policies Alberta may want to consider which have potentially contributed to effective power markets in other jurisdictions.

1) PJM, NEPOOL, Texas and New York required load serving entities[1] to maintain capacity to meet reserve margins for their obligations. Most states that have employed capacity reserve margins for load serving entities have been able to secure sufficient capacity to maintain robust reserve margins. Several states have had difficulty structuring capacity markets to mitigate market power when capacity was tight. Several states, while still requiring reserve margins have dispensed with capacity markets and imposed price caps on capacity.

2) PJM has approached deregulation by starting with a simple market structure and adding products incrementally. PJM and Texas have maintained a rather stable market structure, which has encouraged generation. The concern in NEPOOL is that the reforms contemplated are so complex that they will cause further difficulties for the market.

3) Texas is of the view that market power problems can be eliminate by dispensing with the pool and relying on bilateral contracts. Many economists dispute this belief. However, Texas has benefited from a market structure that has encouraged so much generation that government manipulation of the market to mitigate market power has been minimal. States like Texas which have focused on encouraging generation rather than relying on efforts to manage the market, have succeeded in keeping power costs relatively low.

4) Effective markets give consumers the ability to respond to high prices by decreasing consumption. Some states like New York allow for demand side bidding in their pool and have curtailment programs to facilitate a demand side response. This response is only possible when consumers have time of use meters and clear exposure to market prices. Few jurisdictions have provided these meters to non-industrial customers.

5) Some states employ locational pricing[1] to manage congestion and charge those entities who cause congestion out of merit order costs. PJM prices power at 1,600 nodes and New England is moving to a zonal pricing system. Some states charge all customers the same price, which can have the effect of causing generation and transmission to be sited in locations, which could lead to even more congestion. In addition some states allow transmission owners to sell financial capacity rights, giving the holder the basis differential between two ends of a line. This right

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[1] See Glossary for an explanation

[1] See Glossary for an explanation

allows the holder to hedge against congestion costs and provides some incentive for the transmission owner to expand the system. London Economics, however, questions whether this type of complex pricing system is applicable for a small market like Alberta. PJM and Australia have working merchant transmission models. New York requires transmission customers to agree to pay for transmission expansions, but provides them with financial capacity rights to the incremental transmission.

6) Efficient market design provides price signals high enough to encourage generation construction sufficiently far in advance to provide power at prices high enough to recover costs. The output of Cloverbar is being sold under physical bilateral contracts using the direct sales mechanism. The Balancing Pool is bidding a price which represents their opportunity cost of generating power, their marginal cost of production. If pool prices are lower than Cloverbar's marginal cost of power, Cloverbar is not dispatched and it is cheaper for the Balancing Pool to buy power from the pool to serve physical obligations. The price bid for Cloverbar is setting market-clearing prices below the all in costs of much of the generation in the province. This low price signal may be politically expedient in the short term but may have the effect of delaying expedient capacity expansions. It is hoped that the government will take the initiative to put the output of generation assets into the hands of market participants as soon as possible.

Electricity restructuring is in its infancy in most parts of the world. Some market reform decisions have been clearly destructive. However, it is not clear what set of market reforms being experimented with will best lead to the prices and products customers desire and industry is willing to provide in the long term. Alberta seems to be on the right track. One lesson learned from this research is that the goal of power market restructuring should not be lower prices, but creating effective markets which provide the services customers are willing to pay for. Government intervention has tended to distort markets leading to delays in the signals required to encourage market solutions to problems. It is hoped that his report will assist policy makers in Alberta by providing insights regarding the best and worst market design practices employed in other jurisdictions.

REVIEW OF JURISDICTION RESTRUCTURING

PJM (PENNSYLVANIA, NEW JERSY, MARYLAND)

Pennsylvania Red Index + 66, Rank =2, New Jersey = 47, Rank = 8, Maryland = 56, Rank = 6, Extent of Retail Competition = Initially the greatest in US

Energy: The day-ahead market allows for hedging, while the real-time market balances supply and demand. Day-ahead markets allow price sensitive load to hedge price risk. Prices bid are fixed, but volumes may change. PJM uses a location marginal price to determine marginal prices at 1,600 nodes on the system. This takes into account transmission congestion costs between nodes.

Capacity: Each load serving entity (LSE) has the obligation to own or acquire capacity resources greater than or equal to the peak load that it serves plus a reserve margin of 19%. Securing capacity either in the market or bilaterally has been expensive making retail competition difficult. The penalties allowing owners of capacity to sell it out of state are low, tending to decrease the amount of capacity available domestically. Capacity is in short supply and the ability to make capacity unavailable on short notice has created price spikes.

Firm Transmission Rights[1]: PJM offers financial instrument, which entitles the holder to hedge against uncertain prices between regions caused by congestion.

Transmission: The key drivers for the expansion of the transmission system in PJM were merchant transmission projects. PJM is attempting to expand its competitive market model and congestion management system to increase reliability and market liquidity.

Market Issues:

- Energy markets have a cap of $1,000 per MWh for which PJM has the discretion to accept offers greater than this.
- Must run units can be capped at their marginal cost + 10% or local prices.
- Dispatched must run units receive their offer price.
- PJM has the ability to recall capacity from export markets in emergencies.
- PJM coordinates planned outages.
- The need to cap prices decrease if there were more demand side response, which is limited because most customers are served by fixed priced contracts.
- LSEs often pay more for energy in the wholesale market than they can collect from retail customers, restricting the retail market.
- PJM has good ability to import and export power.
- PJM has been granted provisional RTO status and has MOUs with neighbouring utilities.
- PJM started simply and slowly added products
- More recently wholesale prices in the region have increased substantially causing a large number of customers to return to regulated rates.
- PJM does not have a separate market for spinning and operating reserves.

[1] See Glossary for an explanation

CALIFORNIA

Red Index = 34, Rank = 19, Extent of Retail Competition = Retail market eliminated

Products: Not clear any more. The California Power Exchange was shut down on January 30, 2001 because it was claimed that the exchange could not trade and comply with a FERC requirement that bids not exceed a mandated $150 / MWh. This soft cap initially barred bids in the wholesale market above $150 / MWh from setting the market clearing price.

Transmission: End use customers pay for the fixed costs of the transmission system. Transmission customers pay for losses and the marginal value of the transmission service. Transmission customers can obtain firm transmission rights (FTRs)[1] to mitigate price risk due to congestion charges and secure physical rights to transmission capacity.

Market Issues:

- California entered deregulation with insufficient internal generating capacity with strong growth in demand. The lack of viable forward markets, a strong environmental lobby, inefficient siting processes, and perpetual uncertainty regarding deregulation load to very little supply growth. This coupled with no demand response to price and higher gas prices lead to market power, high prices and blackouts.
- PG&E and Southern California Edison were required until December 15, 2000 to buy and sell all of their generation through the CalPX. They had to secure spot power at high prices to supply nearly all their fixed default supply obligations without the ability to hedge costs.
- More than half of California thermal plants are older than 30 years. Many are forced to curtail production through the year to meet emission limits.
- Since most customers were served under fixed priced regulated rates, lack of demand response may have reduced the pressure for generators to bid more aggressively during tight periods. Even if response was possible, customers have very little opportunity to hedge these prices.
- Since FTRs are short term, they do not provide an incentive to efficiently expand the transmission system.
- The CAISO has been criticized by FERC for not being able to reach decisions on complex matters.
- Market power was addressed primarily by FERC by way of price caps.
- Measures to mitigate high prices are employed by the ISO when reserves dropped below 7%.
- California has attempted to solve its reliability problems by purchasing many long-term contracts for supply at very high prices and eliminating the retail market. Precisely the situations they had seven years ago.

[1] See Glossary for an explanation

NEW ENGLAND

Extent of Retail Competition = Developed, but numerous issues for retailers

Products: The market offers six products. Energy and five reliability or ancillary services products including until recently installed capacity. ISO-NE, the New England ISO, has capped three reserve products at the energy-clearing price.

Energy: NEPOOL, the power pool in New England, only offers a day-ahead hourly market using a merit order process to determine market price and dispatch. Uplift charges are paid for out of merit order dispatches due to congestion.

ICAP: New England has had ongoing problems with this market and eliminated the capacity markets. LSEs are required to maintain certain capacity reserve margins. Energy from ICAP plants had to be offered at actual variable costs. However, the market was thinly traded and prices for capacity were often quite high and capped. Both products were not very useful because the ISO could not call on the capacity to mitigate shortages.

Transmission: New England has many transmission constraints which create problems moving power into and out of New England.

Market Issues:

- New England has suffered from cumbersome governance. A single NEPOOL member can appeal decisions by the ISO and NEPOOL to a Review Board greatly slowing the reform progress.
- Large generation holders were required to divest of generation to minimize market power. However, new owners maintained concentrated ownership.
- The ISO can cap prices to $1,000 / MWh for energy and restricts prices in the operating reserve market.
- The ISO will also investigate possible withholding of capacity when bids exceed defined levels. If a supplier is not successful justifying a bid, the ISO will mitigate the prices bid.
- Poorly performing software has lead to severe pricing mistakes.
- Repeated tariff and market design changes to FERC created uncertainty.
- Senior management turnover at the ISO has made matters worse.
- The ISO has the ability to restate certain energy and ancillary prices after the fact more than once creating complicated settlement processes with unreliable software.
- New England is adopting a multi-settlement process incorporating three part bidding, a day-ahead financially binding market, demand-side bidding, a long-term reserves market solution, zonal bidding, electronic dispatch and self-supply of operating reserves.
- Some retailers have complained that the ISO is not independent enough from NEPOOL to take strong action against market power.

NEW YORK

Red Index = 64, Rank = 4, Extent of Retail Competition: Developed

Energy: The NYISO is divided into 11 congestion zones allowing for locational-based prices. About half of all electricity provided to load-serving entities was through bilateral contracts in 2000. All load not served by bilateral contracts is served through day-ahead and real-time markets. 90% of power in the pool moved through the day-ahead market.

Capacity: LSEs[1] are required to maintain a reserve margin. They can procure capacity through bilateral contracts or through the monthly procurement auction. The NYISO has capped the price of 10-minute non-spinning reserves because these products are controlled essentially by three utilities.

Transmission: Transmission expansions are made through a formal process between transmission customers, owners and the ISO. If all three parties agree to expand the system, transmission customers agree to pay for incremental transmission expansions and receive incremental firm transmission rights. Transmission owners receive congestion rents and a regulated return.

Market Issues:

- New York's greatest concern is obtaining adequate capacity for the next two summers in the New York city area given transmission constraints and large NIMBY issues related to siting transmission lines and generation in the area. No merchant generation has been built in over 10 years.
- New York imposed a $1,000 / MWh cap on energy till October 2001.
- The ISO uses screens to assess whether capacity has been withheld and will mitigate going-forward bids if the offender fails to convince the Market Monitoring Unit that withholding capacity was justified.
- New York faces great difficulty integrating the New York ISO with PJM and New England to form an RTO.
- In an effort to improve reliability, LSEs can bid price sensitive demand into the pool to reduce demand at certain price levels. In emergencies, participants will receive payments of at least $500 / MWh for pledging to reduce load. New York is devising a scheme to allow load to determine a price above which a customer will reduce load.
- The NYISO lacks the authority to retroactively remedy consumers affected by market prices.
- New York has also changed market prices after the fact but now does so automatically in certain limited situations.
- Less than 3% of customers have switched to a retail rate. Retail competition is difficult given the low default rate, fragmented business rules and underdeveloped wholesale market structure. The legislature has failed to pass restructuring legislation.

[1] See Glossary for an explanation

ONTARIO

Red Index = 39, Rank = 16, Extent of Retail Competition = In design

Energy: Energy will be sold in a real-time market managed by the IMO. Provision has been made for the creation of private sector financial forward markets for hedging purposes settled like contracts for differences. The IMO will also administer an operating reserve market in real-time. Participants will also be able to buy and sell power through bilateral contracts. Generators required to run or not run due to transmission constraints will receive the market-clearing price plus a congestion payment.

Ancillary Services: Operating reserves will be obtained through the real-time market. Black-start capability, reactive supply and voltage support will be procured on a contract-basis through a competitive tendering process.

Transmission: By offering financial rather than physical transmission rights, the IMO hopes to mitigate potential market power abuse through the withholding of physical transmission rights. However, generators with market power holding an import transmission right can curtail generation to increase the value of the transmission right. Transmission will be paid on a postage stamp basis. This proposal may not send the right signal for the need for system expansion.

Retail Markets: Retailers will be able to buy power from their distributor through a default supply option or through contracts with marketers. Customers with loads greater than 150,000 kWh will pay the market-clearing price.

Market Issues:

- Ontario's primary problem remains market power because OPG controls the majority of generation in the province.
- The Market Power Mitigation Agreement stipulates that OPG must rebate a portion of its power sales revenue back to customers above $38 / MWh for the first four years. In addition OPG will be required to decontrol price-setting plant to 35% within 42 months and must not control more than 35% of market in 10 years. No other player is allowed to control more than 25% of peaking or total capacity.
- The price cap is easily avoided and the divestiture plan may take too long.
- The Standard Service Supply will be a form of pool price pass through eliminating the risk that suppliers will not recover purchases made at high prices.
- Ontario is also auctioning congestion rights on interties with neighbouring markets.

TEXAS (ERCOT)

Red Index = 65, Rank = 3, Extent of Retail Competition =Initially successful

Energy: There is no centralized pool mechanism through which generators and LSEs can exchange energy. All electricity is transacted by bilateral contracts. Qualified scheduling entities (QSEs) are directed to supply energy, based on bid prices, used to balance the system. If congestion exists, ERCOT will segregate bids by congestion zone.

Ancillary Services: QSEs are required to buy certain amounts of ancillary services from ERCOT or other sources each hour. ERCOT receives bids for ancillary services in a day-ahead market using a merit order process. QSEs pay the single market price for ancillary services in the day-ahead market.

Transmission: Transmission customers are billed a fee based on their coincident peak demand. Billing and settlement occur monthly and independently of ERCOT as part of the bilateral energy contracting process. A congestion fee will be predetermined each year and used to compensate QSEs for any balancing energy they provide. In the future, a zonal congestion management system will be established with transmission congestions rights. ERCOT will determine when transmission will be upgraded.

Market Issues:

- Texas argues that the absence of a pool eliminates the possibility of market power in the energy market. Two utilities control 55% of sales.
- A $1,000 / MWh cap has been placed on bids into the balancing energy market. However, lack of interstate connections increases market power.
- By 2002 no power generation company will be allowed to own more than 20% of installed capacity in any power region in ERCOT. Former IOUs will be required to auction off entitlements to power for at least 15% of their installed capacity. Utilities were required to unbundle services.
- Market surveillance units lack the power to initiate sanctions against violators, but rather make recommendations for remediation to ERCOT.
- By equaling sharing the costs of congestion among all QSE's, rather than among the parties responsible for the constraints, the financial burden may not fall on those exacerbating congestion and may encourage generators and LSEs to increase congestion.
- Substantial reliance on bilateral contracts can reduce price transparency and increase generators ability to extract rents.
- Reserve margins in Texas are anticipated to be between 25-30% for 2001-2003. A small surplus of power heading into restructuring and subsequent building of generation has decreased market power issues that may have surfaced.

AUSTRALIAN NATIONAL ELECTRIC MARKET (NEM)

Capacity = 38,900 MW, Peak Demand = 29,700 MW

Energy: There is a compulsory real time spot market which establishes prices in 5 zones. There is no provision for bilateral contracts. A market for trading ancillary services is under development.

Retail Markets: The transition from regulated retail rates to full retail competition for which there are no regulated prices for final customers is almost complete.

Transmission: There are significant transmission constraints within the system. NEMMCO is an independent operator of the spot market and is also the system operator. Transmission service is provided by a number of regulated Transmission Network Service Providers (TNSPs) and unregulated Market Network Service Providers. The latter groups are merchant transmission owners who recover costs by trading energy across their lines. The London Economics material indicated that MNSPs own high voltage DC transmission lines and seem to bid energy into the pool from dedicated plants to recover both the cost of the generation and transmission.

Market Issues:

- Very few direct constraints are placed on the behaviour of participants. There are no constraints on prices offered. Market power is managed through the *Trade Practice Act*. If the monitoring body believes an incident inconsistent with the objectives of the market has occurred, a government body is notified. There have been no formal actions taken in respect to anti-competitive behaviour. There have been non-public negotiations to settle concerns.
- Most customers are not exposed to market prices because they are served under vested contract imposed at the time of reform or freely negotiated contracts which typically do not expose customers to extreme prices.
- There is no formal forward market, day-ahead market or capacity market.
- 80% or more of total demand is sold to customers through contracts for differences.
- It is unclear whether this simple market will operate as well under full retail competition and congested market conditions.
- There is also a great deal of government ownership of competitive assets.
- NEM has successfully adopted a model to handle merchant transmission. Unfortunately the material provided gave little detail on this subject.

ENGLAND AND WALES

Capacity = 66,200 MW, Peak Demand = 52,800 MW

Energy: Most energy will in the future be traded through a bilateral market. A balancing market has been established were accepted bids receive their bid price. Parties deficient in power will be charged the cost of procuring this balancing power. Parties with a surplus of power will be charged a price to dispense with the surplus.

Ancillary Services: These services are procured through a tendering process. These services are paid for by a charge imposed on all participants.

Transmission: The transmission operator National Grid Co. sets a revenue cap for charges recovered 25% from generators and 75% from suppliers. Charges are set for 16 generation zones and 12 demand zones. Charges are set using long-run marginal cost principles. The same legal entity is barred from holding licenses for both electricity supply and distribution.

Retail Market: The transition has been made to full retail competition.

Market Issues:

- The New Electricity Trading Arrangement (NETA) is based on the freedom to trade bilaterally with no requirement to trade through a pool.
- NETA does not mitigate strategic behaviour in the balancing market, while it reduces transparency and increases the risk of bidding mistakes.
- The old market set binding prices a day ahead. This left all participants exposed to price consequences of changes in circumstances after the market closed.
- Concentration in generation gave rise to prices that fostered more rapid entry of generation into the market than was perhaps efficient.
- NETA has not corrected the inadequate treatment of network congestion. Congestions costs are not born by those who caused them. Since congestion charges are shared equally, participants will not receive appropriate economic signals related to short-term transmission losses, transmission constraints and locational decisions for major new connections.

NORD POOL

Capacity = 90,000 MW, Peak Demand = 64,800 MW

NORD pool is a profit maximizing company set up to operate markets for its member countries of Norway, Sweden, Denmark and Finland. It is not a fully integrated market or regulated regime.

Energy: Energy is sold in a loose pool where participants are free to buy and sell via bilateral contracts or on separate market exchanges across several countries. Producers may sell directly to consumers, supplier may buy from other generators or from Nord Pool and resell the power. Brokers and traders are active in the market. There are two physical delivery markets and two financial markets. In one market, settlement occurs weekly netting out purchases and sales, fees and capacity fees.

Ancillary Services: These are provided through contractual arrangements between suppliers and each national grid operator.

Transmission: Transmission tariffs in each country are regulated by each country. The fixed components may vary by location. Congestion is managed using zonal pricing. Whenever internal constraints prevent dispatch as programmed, in most countries the system operator will buy more power on the demand surplus side of the constraint and sell it on the supply surplus side, at a loss. Physical bilateral and contracts for differences can be used to hedge against price differentials across interfaces. The transmission administrators in many areas are profit maximizing and manage the transmission network and have system control.

Market Issues:

- There is little market concentration on the supply side and access to the transmission grid is provided to virtually all Nord Pool customers.
- Large reserve margins have limited market power. However, the ability of the system to respond well under constrained conditions has not been tested.
- Each Nord Pool country has its own Competition Authority to monitor energy and other markets. However, there are serious limitations on the discovery of market abuse and punitive power to mitigate problems. None can effectively monitor multinational transactions.
- Nord Pool has a history of high demand side response because of the reliance on hydro.
- There is a lack of coordination and specificity across Nord Pool on cover requirement for distribution and marketers.
- There is a lack of clarity on what energy costs are permissible for recovery by the wires companies serving native load.
- Nord Pool has incompletely rationalized tax and environmental regimes.

CONNECTICUT

Red Index = 43, Rank = 13, Extent of Retail Competition = Some Retail choice offered

Connecticut is a member of NEPOOL.

No detail on products.

Market Issues:

- Connecticut's restructuring called for a 10% overall rate reduction through 2003 via a standard offer to all customers not being supplied by a competitive electric supplier.
- Connecticut had the forth highest total average rate for power.
- Most of the generation in the state has been divested to insure unbundling.
- In early 2001, the ISO NE reported concern that additional pipeline capacity will be needed to accommodate all the planned gas fired generation.
- It is evident that until the Standard Offer rate is increased to at least a market level in New England, it will not be possible for retail suppliers to compete with these below-market Standard Offer rates. Customers can switch back and forth between rates.
- Utilities must charge a 0.3 cent / kWh fee to fund energy conservation programs and utilities must have about 6% of their generation provided by a renewable resource before 2009.

ILLINOIS

Red Index = 45, Rank = 10, Extent of Retail Competition = Some Retail choice offered

Retail Market: Customers have the option of accepting a rate offered by a retailer, staying on a regulated default rate or going onto a Power Purchase Option (PPO) rate which exposes customers to the Market Value Energy Charge less 8%. About 14% of load has switched to competitive rates as of the end of 2000 mostly in ComEd's territory.

Market Issues:

- The PPO rate is the most popular option, however, very few customers have signed up with retailers.
- Many of the best customers have been tied up in long-term contracts.
- Some utilities in Illinois are proposing to belong to two different RTO configurations. This has made improving the wholesale market structure difficult.
- Illinois has reciprocity requirements that prevent certain out-of-state utilities from having their affiliates certified in the state unless the out-of-state utility allows Illinois utilities to operated in their service territory. This is limiting competition in the state.
- There is no set of standard retail access tariffs or standardized business rules, making it difficult for retailers to comply with all the requirements in each service territory.

MICHIGAN

Red Index = 42, Rank = 14, Extent of Retail Competition = Some Retail choice offered

Market Issues:

- Many of the large industrial customers in the state have been locked into 10-year contracts and are therefore not eligible for retail competition.
- Merchant generators face high taxes, which make it less attractive to build plants. A plant in Michigan would pay about four times more tax than one in Texas. Natural gas is expensive and environmental requirements stipulate that all new plants employ selective catalytic reduction systems.
- Some of the utilities are required to auction off 12.5% of their capacity to stimulate retail competition.
- Residential rates have been frozen till the end of 2003 at a 5% discount to May 2000 rates.
- Utilities are not allowed to own more than 30% of generation capacity in the state. A number likely too high to control market power.

POLICIES AND CONDITIONS AFFECTING MARKET DESIGN

FACTORS AFFECTING SUPPLY

A) Conditions Causing Tight Supply

- Many jurisdictions such as Texas entered deregulation with a surplus of power, making it difficult for existing generators to exercise market power to drive up prices. Existing generators compete against each other to keep their units online and drive prices down.

- Generators in New England have doubled the forced outage rate since deregulation, physically removing generation, which causes more expensive generation to be dispatched. Some do so in the day-ahead market to avoid having to buy in the real time if prices shoot up and a unit goes down.

- Generators financially remove generation by bidding very high prices forcing other expense bids to set the market-clearing price.

- Limited transmission interconnection with other jurisdictions with New York and PJM reduces the ability for imports to resolve supply shortages.

- Credit problems with domestic utilities in California decrease the incentive for importers to sell power to utilities at reasonable prices.

- New York and California are facing demand growth without subsequent supply growth. In California supply is decreasing as old plant is decommissioned.

- Transmission constraints inside New York, NEPOOL and California limit the ability of power in one area to be moved to load in another area forcing expensive local generation to be dispatched in constrained areas.

B) Policies Contributing to Tight Supply

- Manipulating the market to forbid suppliers from maximizing profits by forcing generation to run or by imposing price caps or by retroactively changing market prices has the short-term effect of reducing prices. However, in many states such as California, the impact of government intervention has slowed the addition of new generation needed to make the market more competitive.

- Forcing utilities to purchase power from the spot market to serve fixed priced obligations without the ability to hedge or recover costs has destroyed the ability of California's utilities to procure power on a timely and cost effective basis.

- States that have stringent environmental and siting policies have restricted the ability of generators to site plants or transmission to alleviate supply constraints. California had hoped that neighbouring states with less stringent environmental regulations would supply them power.

- California and Michigan have environmental or tax policies which increase the cost of generation or restrict the ability of plants to operate, and in some states forced generation capital to flow to other states.

- States such as California, who have changed deregulation laws several times, have created uncertainty regarding the ability of generation investments to return capital. This has discouraged generators from siting plants in many jurisdictions. Changes to laws in California and New England have also discouraged the addition of pipeline capacity required to serve new plants.

- States who have not figured out how to price and increase transmission have found themselves with congestion issues at their borders and internally. California had blackouts partially because it was unable to move available power across the state.

- California had hoped that a strong demand side response, even though most customers had not incentive to do so, would compensate for restrictions placed on the pace of generation expansion. The actual demand side response was blackouts and closed businesses. In order to reduce load in the area, several large industries have been paid to close down for several quarters.

- According to the Cambridge Energy Research Associates, "California has perhaps the most time consuming and costly power plant approval process in the nation – including an open-ended environmental review process, and well-coordinated local community opposition."

- NEPOOL and Australia lack a day-ahead energy market, which diminishes a customer's ability to anticipate future prices and respond by reducing load. PJM and New York have day-ahead markets.

C) Conditions Enabling Adequate Supply

- Ontario is entering deregulation with a surplus of supply. This excess supply helps maintain the supply of power since developers are less likely to build plants in the face of uncertainty regarding market rules.

- Nord Pool inherited a great deal of demand side response because industrial customers were used to demand restrictions inherent to systems based on hydro generation. Demand side response has the effect of reducing the amount of generation supply required all things being equal.

- PJM inherited significant transmission surpluses for many regions both with external markets and internally. This transmission capacity reduced the congestion constraints that can lead to inadequate supply of power regionally.

D) Policies Enabling the Addition of Supply

- One of the keys to Texas's success in securing substantial new generation is its commitment to not tinker with market rules and operations. This stability reduces the uncertainty that capital will be recovered. New York has taken steps to speed up the process used to approve and permit generation projects.

- Given the immaturity of deregulated markets and the long lead times required to build transmission, none of the materials provides clear evidence as to the best approach to provide sufficient transmission. California relies on cost-based usage charges resulting from congestion to indent transmission expansion. The owner can agree to pay the full cost of an expansion or the ISO may agree to recover the cost through regulated rates.

- New York relies on agreements between transmission customers requesting an expansion and transmission owners to pay for incremental system expansions.

- PJM coordinates planned outages schedules to maintain adequate supply.

- New York is allowing demand side bidding[1].

- PJM, Illinois, Michigan and New York allow third party metering. By expanding the ability of retailers to offering competitive metering services, the number of customers with meters designed to measure hourly consumption should increase. This should allow more customers to respond to high prices by reducing consumption.

- The Center for the Advancement of Energy Markets reports that New York and Texas have taken aggressive action to encourage distributed generation. This can be accomplished by removing restrictions related to connecting to the grid and by fairly pricing costs for host to obtain back up power.

- New England, New York, PJM and England and Wales employ some form of capacity payment process to incent new generation. England and Wales employ the energy adder mechanism. New England, New York and PJM require load-serving entities to maintain reserves margins and in some cases provide markets for trading and procuring capacity.

E) Relevance to Alberta

- Many markets employ some type of payment for capacity besides energy. Several markets including NEPOOL have, however, had difficulty employing markets to facilitate these payments.

- The output of Cloverbar is being sold under physical bilateral[1] contracts using the direct sales mechanism. The Balancing Pool is bidding a price, which represents Cloverbar's opportunity cost of generating power, its marginal cost of production. If pool prices are lower than the marginal cost of power, Cloverbar is not dispatched, and it is cheaper for the Balancing Pool to buy power from the pool to serve physical obligations. Cloverbar

[1] See Glossary for an explanation

has been bid into the market at prices so low that some of the generation in the province is unable to recover their full cycle costs. Some generators may be defaulting on loan provisions. This low price is potentially distorting price signals delaying the construction of new generation. In addition, if generators default on loan provisions, if will be difficult to encourage financiers to invest in new generation in the future. London Economics encourages governments to divest of assets with the ability to alter the market.

WHOLESALE MARKET DESIGN

A) Evidence of Poor Wholesale Market Design

- Computer problems in New York and New England have allowed for illegal bids to set market prices or clear the market for energy and ancillary services, and in some cases have forced off cost effective generation.

- Lack of forward markets to hedge prices and reduce the impact of spot prices has reduced the ability of customers to protect themselves against large swings in market prices. According to London Economics, only Nord Pool has a functioning forward market. California and PJM also have some limited form of forward market.

- Some jurisdictions such as NEPOOL have ineffective and conflicted decisions making bodies which impede the implementation of reforms to fix problems related to market rules and monitoring power.

- Endless changes in New York and California affecting pricing, project siting and other pool rules have created uncertainty.

- Lack of Monitoring Authority power to check the market power of incumbent monopolies allows for price spikes. Early in 2000, NEPOOL had few powers to mitigate price spikes. Texas monitoring authorities lack the ability to apply sanctions against those who manipulate the market.

- Lack of demand side bidding[1] reduces the ability of the market to suppress prices by reducing load in response to price hikes.

- Inadequate generation and transmission to maintain secure supply and relatively low stable prices.

B) Policies Contributing to Flawed Wholesale Markets

- A single NEPOOL member has the ability to appeal decisions effectively stalling important market reforms. Since the ISO-NE is in many ways obligated to respond to the dictates of the pool whose members have conflicting priorities, ongoing market problems will persist.

- Complicated congestion management and multisettlement market designs in large jurisdictions such as NEPOOL threaten to disrupt the market even further as new software is implemented.

- NEPOOL members were forced to divest of generation assets providing, energy, capacity and ancillary services but simply sold them to other large out-of-state utilities who created concentrated ownership. Michigan allows utilities to own as much as 30% of the

[1] See Glossary for an explanation

capacity in the state guaranteeing market power status for some of the utilities. Some economists suggest a 20% ownership cap.

- Some jurisdictions such as Nord Pool, New England and Texas have inadequate monitoring and sanctioning authority to penalize suppliers for gaming the wholesale market. Many jurisdictions have favoured designing the market so that government intervention is not necessary. The forced divestiture of generation limiting the proportion of generation a utility can own, unbundling of services, encouraging demand side responses, generation and transmission expansions have been helpful in this regard.

- States that have changed deregulation laws or like New York have the ability to change market prices after the fact, have created uncertainty regarding the ability of power projects to return capital. This has discouraged generators from siting plants in many jurisdictions. It has also discourages the addition of pipeline capacity required to serve new plants. New York will be seriously short power for two more summers.

- In Cambridge Energy Research Associates opinion, it is not a good idea to solve short-term power shortages be engaging in relatively high priced long-term contracts as California did. As the market is allowed to operate, prices naturally decrease as supply increases putting these types of contracts out of the money.

C) Conditions Enabling Effective Wholesale Markets

- Excess generation and transmission supply reduces the need for state intervention in the market. State intervention causes a cycle of uncertainty, less new generation which perpetuates market power problems.

D) Policies Enabling Effective Wholesale Markets

- Texas, California and England have moved away from tight pools[1] in favour of bilateral market designs in an effort to eliminate the opportunity for suppliers to bid prices up in a coordinated market where system events can be predicted to have an impact on prices. Reducing customer choice and reducing the possibility for forward markets can make a market less liquid and makes comparison of prices offered difficult increasing rents for utilities. London Economics maintains that gaming and volatility are a function markets and that bilateral markets will not solve these problems.

- New York is proposing to allow virtual bidding (trading by entities who do not control generators or loads) to create more liquid markets to reduce gaming. This will cause technical challenges for the ISO linking physical and financial realities.

- New York is proposing to set up trading hubs to allow trades to occur at a common point on the transmission system, so that traders do not need to take locational differences in transmission losses or congestion costs into account.

[1] See Glossary for an explanation

- Most markets restrict the ability of generators to reprice bids in the real time markets when bids have been established in the day-ahead market to reduce the ability of generators to game the market.

- Most states required wires owners to unbundled or divest their generation assets to reduce the incentive for companies to preferentially provide wire services to their own generators. The UK requires that the same legal entity cannot both supply and distribute electricity.

- Congestion management which charges those causing high prices due to congestion, provides incentives to site generation or build transmission to reduce congestion in those areas.

- A strong monitoring authority with the power to mitigate market power seems to be a good short-term mechanism to keep prices low. However manipulation of the market creates uncertainty and flawed markets require ongoing monitoring. The Center for the Advancement of Energy Markets and London Economics suggest that the goal should not be lower prices, but effective markets which provide the services customers are willing to pay for.

- London Economics expressed a concern with the level of government ownership of generation in Australia. Governments may intervene in the market to suppress prices to satisfy voter preferences in the short term. The medium term implications can be unnecessary bankruptcies of investor owned plants and the delay of new generation, which ultimately drives prices to very high levels in the future.

E) Relevance to Alberta

- Market redesigns which are complicated or diverge greatly from current practices threaten to disrupt the operation of the market. Such changes can cause uncertainty and mistakes, both of which tend to keep competitive forces from engaging in the market. Retailers would be concerned about losing profits, and developers would be concerned that new projects won't return capital.

- Congestion management is effective when it provides price signals within relatively large market areas to site generation or transmission to mitigate the price effects of congestion. London Economics questions whether a congestion management system based on location based pricing for energy and transmission would be applicable for a small market like Alberta.

- London Economics expressed a concern regarding the level of government ownership of competitive assets in Australia. Governments tend to distort markets to serve the interests of those most willing to vote for them. In most cases in the power business, that has meant low prices for consumers. Efficient market design provides price signals high enough to encourage generation construction sufficiently far in advance to provide power at prices customers are willing to pay to recover costs. An effective wholesale market design should not require the management of competitive assets by government.

WHOLESALE ENERGY PRODUCTS

A) Evidence of Product Problems

- Lack of real-time markets may not provide competitive bids to balance supply and demand and creates a dependence on potentially high priced day ahead offers. Lack of a real-time market exposes generators to price consequences related to real-time circumstances. New England, PJM, New York, the UK, Ontario and Australia have real-time markets.

- The single settlement system such as NEPOOL's creates a strong incentive for generators to manipulate prices in real time by changing import/exports and reducing supply. Lack of a day-ahead market reduces the ability of customers to anticipate future prices and respond accordingly by moving to reduce demand. Lack of liquidity means that consumers cannot hedge their future obligations. Lack of price transparency makes it difficult for generators to know when they should shut down their plants for maintenance. A day ahead market fixes prices in the next day reducing the number of customer affected by real time manipulation of the market.

- The requirement to use caps on energy and ancillary services as anything other than a short-term measure to manage market power suggest that the market may have an inherent flaw. Price caps discourage new supply because of the uncertainty about whether capital will be returned.

- California set soft price caps so low that existing plants could not run and recover fuel costs.

B) Policy Reducing the Effectiveness of Energy Markets

- California had a history of failing to allow utilities to recover costs under long-term gas contracts. These same utilities were unwilling to sign long term power contracts to manage risk for fear that they might not be able to recover fair costs. Lack of hedging provisions exposed the utilities to generators that more recently acquired the ability to drive spot prices up.

- Some marketers in New York and New England have petitioned their ISO administrations and FERC to adopt a "pay as you bid" method to determine the price generators receive. (Dispatched plants receive their bids rather than a market-clearing price.) According to the New York Department of Public Service, the Market Clearing Price has the advantage of allowing ISOs to have knowledge of costs curves to better operate the system and because participants don't have to guess the clearing price to optimize profits, it is cheaper for small players to bid and market power monitoring is easier. FERC maintains that the "pay as you bid" method might encourage sellers to increase their bids since they are not receiving the clearing price. London Economics criticizes the UK for employing "pay as you bid" for pricing real time imbalances.

- The New England ISO has had difficulties with single-part bidding in the energy market. As a result, ISO-NE proposed a three-part bidding system which would allow a generator

to bid in a supply curve that includes a start-up cost bid, a bid for operating at minimum load and a minimum load level, an incremental energy bid, and availability bids for ancillary services. PJM and the New York ISO use similar three-part bids for energy.

C) Policies which Enable Effective Energy Markets

- Making fundamental changes to the market if it is flawed rather than relying on manipulation of the market, such as price caps, to manage market power.

- New York facilitates demand side response by allowing demand side bidding[1]. In addition encouraging hourly consumption metering and removing fixed priced regulated rates would make customers less captive to activities by generators with the ability drive up prices. NEPOOL has two classes of customers willing to interrupt load based on an interruption notice.

D) Relevance to Alberta

- There has been talk in Alberta of implementing a system where generators do not obtain a market-clearing price, but instead obtain the prices they bid when they are dispatched. FERC has discouraged this type of pricing and very few jurisdictions employ it.

[1] See Glossary for an explanation

ANCILLARY SERVICES[1]

A) Evidence of Flawed Ancillary Service Markets

- Ancillary services markets in New York and New England have been plagued by very high prices; and as a result prices for ancillary services, prices have been capped. New York has placed a $2.52 / MWh bid cap on 10-minute non-spinning reserves because 97% is owned by two companies. The New England ISO caps 10-minute reserves at the prevailing energy price.

- Ancillary services markets being eliminated. The New York ISO has asked for permission to suspend the use of market-based bids for operating reserves until those markets could be demonstrated to be workably competitive.

- Insufficient reserves from ancillary services to keep the lights on is a severe indication of a flawed ancillary services market.

B) Policies Harming Ancillary Services

- New York failed to require two companies owning 97% of non-spinning reserves to divest of these assets to multiple owners to mitigate market power. Instead, they have imposed price caps with no longer-term solution to create a workable market for these services.

C) Conditions Enabling Ancillary Services

- Ontario has inherited a system which aside from some hydro assets, has very little in the way of peaking generation. An excess of ancillary generation resources owned by many competitors reduces market power.

D) Policies Enabling Ancillary Services

- Requiring that the majority of ancillary services be acquired through competitive markets.

- Owners of ancillary generation assets should be forced to divest of assets to reduce their ownership to below 20% of the total market.

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[1] See Glossary for an explanation

CAPACITY MARKETS

A) Evidence of Flawed Capacity Markets

- Since no day-ahead capacity market existed in New England, capacity prices were determined after the fact forcing retailers to pay whatever price was set.
- Capacity markets which fail to provide appropriate signals to increase installed capacity to maintain reasonable reserve margins.
- ISO-NE could not call on installed capacity reserves to produce energy at specific times and at contractually specified prices. (That was the responsibility of the energy services providers.)
- New Jersey retailers complained that when they had to pass on high capacity charges to customers, their offers become unattractive compared to the regulated rate insulated from these price increases.
- Capacity providers were able to manipulate the markets in New England by withholding capacity on short notice. As a result, New England's capacity markets have been eliminated and replaced by deficiency charges. One marketer is facing loss of NEPOOL membership because it cannot pay a $700,000 capacity charge that was allowed to clear the market.

B) Policies Issues Affecting Capacity Markets

- Texas, PJM, New England and New York all require load suppliers to maintain capacity reserves for their load requirements plus a fixed capacity margin. All these areas initially designed markets to sell capacity products.
- When the penalties for delisting capacity in PJM were low, generators would delist capacity and sell energy into neighbouring markets, driving up the cost of securing capacity.
- Capacity markets which did not provide sufficient penalties for failing to secure capacity, incented retailers to rely on the energy market. Doing so removed the price signals needed to encourage new generation.
- When load serving entities are not required to secure capacity over the long term, capacity markets would often be volatile reducing the incentive for generators to build new capacity. PJM is proposing that capacity be purchased on an annual or semi annual basis and that all capacity resources be offered on the same basis with a bid cap.
- CERA maintains that the capacity market allowed Texas to enter deregulation after California with a lower capacity reserve margin because it provided sufficient price signals to add about 5,500 MW of new supply in the last few years with 14,000 MWs under construction.

- Cambridge Energy Research Associates believes that capacity charges, coupled with penalties for failing to procure capacity, sends price signals to developers several years in advance of the energy market that capacity is required and people are willing to pay for it. Most customers are unwilling to sign long-term energy deals because commodity prices are too volatile, making capacity contracts more attractive to secure reserves.

C) Policies Enabling the Effective Capacity Markets

- Forcing generators to divest of assets to reduce their ownership of capacity to below 20% of the total market reduces the potential for market power.

- Many economists believe that an energy only system provides a signal that capacity is needed 3 years before it can be built. They assume that developers are not willing to invest in generation based on forecasts of supply and load growth. Many suppliers are unwilling to hedge forward obligations with energy contracts because energy is so volatile. Hence, there may be a need to provide a signal to build generation through a capacity payment.

- If a reserve margin requirement is imposed on load serving entities as a means to secure generation, then stringent penalties must be applied to load serving entities and capacity providers who fail to secure capacity as required.

- Capacity requirements need to be over longer terms to incent new generation.

- Deciding to eliminate unnecessary uncertainty and other impediments impeding the building of generation will increase more generators to provide new capacity, keeping capacity prices in the market low.

D) Relevance to Alberta

- Most deregulated jurisdictions employ some type of capacity payment in addition to energy prices to incent the construction of new generation. Most of these jurisdictions required load-serving entities to maintain capacity margins and employ some type of market to trade options on capacity. The following websites provide a good discussion of the options available for incenting new capacity.

http://www.iemo.com/imoweb/historical_devel/mdc/ArchivedDocuments/Ph2/Wholesale%20Market/AlternativeApproachesToAssuringCapacity.pdf

http://www.iemo.com/imoweb/historical_devel/mdc/reports/InterimReport2/chapter3.pdf
(see page 3-24 to 3-32 for details)

TRANSMISSION AND CONGESTION MANAGEMENT

A) Evidence of Ineffective Transmission Management

- Transmission hording problems and phony congestion problems have contributed to higher prices in some states. In some states, entities with title to transmission capacity would not allow it to be used. This kept imports from moving into the area to reduce prices.

- Uplift charges paid equally by everyone, make market participants pay for congestion problems they did not cause. They also provide no rational price signals to guide builders of generation or transmission to solve congestion problems. They may even encourage the inefficient location of generation making congestion worse.

- Gaming by generators creating congestion problems.

- Market barriers to efficient imports and exports.

- Lack of ability to manage congestion costs. Some generators withhold generation in some areas to allow them to receive their bid price when they are required to run out of merit order.

- No price signals or ineffective regulatory structures to encourage or pay for transmission expansions.

B) Policies Reducing the Effectiveness of Transmission Management

- New England does not allocate congestion management costs to those who cause the congestion. PJM and New York both use locational marginal prices to allocate congestions costs to those loads which cause congestion giving them an incentive to mitigate the congestion.

- In New England, generators receive their offer prices whenever they are dispatched above the energy-clearing price because of congestion. This encourages gaming and encourages generators to bid-unit characteristics that provide higher uplift payments than a competitive market would supply.

- The New York ISO only permits imports and exports to flow if they will reduce the market-clearing price. Problems with software have caused illogical curtailments. This ability to curtail power has meant suppliers often have to find high priced alternatives to meet load obligations. It also made PJM unwilling to continue to pre-schedule transactions into the state of New York.

- If PJM forecasts that a plant will be have to run the next day to relieve a transmission constraint, it can declare the plant a "reliability must run" unit. The price the plant receives is capped at the higher of its costs plus 10% or the locational marginal price.

- New England retailers believe that transmission capacity is being "hoarded" to reduce access to end-users to non-NEPOOL sources of supply to drive up prices. FERC initially rejected attempts by NEPOOL to impose charge for failing to use transmission capacity. ISO-NE is proposing to use a market-based mechanism that would prioritize transactions over the tie lines.

- NSTAR has refused to join New England's RTO proposal because it believed that since the transmission coordinator would not control dispatch it would have an incentive to build transmission rather than generation to solve congestion problems, which might not be the least cost solution.

C) Policies Enabling Effective Transmission Management

- PJM allows holders of FTRs[1] to receive compensation for congestion charges allowing marketers to hedge congestions price risks. These FTRs also act as an incentive to encourage new transmission.

- If physical transmission rights are granted, mechanisms should be applied to keep companies from failing to use the transmission to keep power from an area in an effort to drive up prices. Penalties for failing to use the capacity could be applied. Fees charged to use the capacity would also discourage gaming.

- Charging those entities which cause congestion, the costs associated with congestion encourages the building of generation or transmission to elevate higher prices. The following website provides an example of congestion pricing.

  http://www.iemo.com/imoweb/historical_devel/mdc/ArchivedDocuments/Ph2/Wholesale%20Market/ZonalApproach.pdf

D) Relevance to Alberta

- London Economics questions whether location marginal pricing[2] is appropriate for a small market like Alberta given its complexity. Some economists question whether it provides sufficient signals to expand transmission. New York employs a system where customers in one area agree to pay for the cost of transmission upgrades. The following website review location base pricing of transmission[1].
  http://www.iemo.com/imoweb/historical_devel/mdc/ArchivedDocuments/Ph3/TD/td_4-3.pdf

- Australia seems to be employing a merchant transmission model where large generators connect to the system with high voltage DC lines and recover the costs of their generation and transmission interconnections from energy revenues.

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[1] See Location Based Transmission Pricing in Glossary for an explanation
[2] See Congestion Management in the Glossary for an explanation

RETAIL MARKET DESIGN AND FUNCTION

A) Evidence of a Flawed Retail Market

- In most jurisdictions, lack of time of use meters or fixed priced default rates reduces the incentive for consumers to reduce load during high prices. This lack of demand side response increases market power allowing generators to set prices that would be lower if customers were willing to shed load. Customers consume more than they otherwise would ultimately increasing costs to be recovered later and ISO have more difficulty optimizing system operations.

- The New York ISO does a poor job of communicating frequent rule changes and other important information to market participants making it expensive for retailers to figure out what is going on. Some retailers believe that the ISO has no financial incentive to solve problems in an effective or timely manner.

- New York required retailers to provide data in formats and with systems that were difficult and expensive to handle.

- New York retailers have complained about settlement data that has been routinely late and inaccurate, and the inability to obtain data to verify a bill. New York has after the fact changed market prices making it difficult for retailers to know what their final bills may be.

- Pennsylvania's incumbent utilities signed up long term fixed price supplies of power to hedge future prices when they divested of their generation. By comparison new retailers are more exposed to high and volatile wholesale prices because they have fewer options to obtain fixed priced supply. Wholesale prices increased recently causing retail prices to increase. Therefore many customers are switching back to regulated rates.

- The inability of customers to evaluate the risks and the potentially small benefits of a proposed rate offer from a retailer, contributes to a lack of retail switching. The Center for the Advancement of Energy Markets considers that PJM, New York, Illinois, Connecticut and Texas have done a good job of educating customers.

- Without a competitive retail sector, there are fewer opportunities for generators to strike contracts to fix the price of power they generate. The cost of financing a generation project will be cheaper, the more stable a generator can make the margins it produces from a project.

B) Policy Reducing the Effectiveness of Retail Markets

- Setting regulated rates at low levels reduces the incentive for customers to switch to competitive rates offered by retailers. California has set the price customers compare retail offers at a wholesale price rather than at a price that includes costs for transmission and distribution. This low rate makes it almost impossible for retail customers to compete against the wholesale rate offered by the state.

- Market designs, which do not provide for the ability of customers to hedge prices, have encouraged customers to stay on regulated rates and has made it easier for suppliers to force customers to take price increases. Only California and PJM have some form of evolving forward market while Nord Pool has a forward market.

- Policy makers in Illinois allowed incumbent utilities to sign long-term contracts with good customers making retail marketing difficult for new entrants.

- Failing to increase regulated rates to compensate distributors for providing regulated rates when wholesale prices increase destroys margins. In addition non-incumbent retailers who secure supply from the wholesale market would have a competitive disadvantage if regulated rates don't reflect increases in wholesale prices.

- Many distribution companies have an incentive to keep consumption high because they recover many of their costs on a variable basis. Some incumbent utilities inhibit retail competition because it decreases the opportunity for generation subsidiaries to take advantage of market power.

- Fixed standard offers or default rates insulate customers from market prices causing them to fail to reduce consumption to mitigate high prices. Since in many jurisdictions retailers are compensated when regulated rates are not recovered by wholesale prices, excessive consumption during high market prices only serves to increase rate riders in the future.

- Lack of commitment or faith in the market has led California to eliminate its retail market. The state obviously believes it knows what price, volumes of power and services customers desire.

- The rate of return for incumbent distributors acting as retailer is relatively stable when regulated rates make provision to recover cost increases for the supply of power. Encouraging customers to switch to other rates is expensive and may come with more risk or cost to hedge risks. If the regulated rate is above the wholesale rate, distributors have less incentive to aggressively offer lower rates unless they are facing stiff competition.

- Ohio has a target of pricing retail rates low enough to encourage 20% of customers to switch by a targeted date. After which switching incentives would decrease.

- In addition to fixed standard offer rates, the cost of interval meters, the challenge of recruiting and educating customers who are not familiar with the potentially small benefits of load curtailment and insuring that programs do not result in air pollution problems from increased diesel generators act as barriers to the adoption of load curtailment programs. In addition billing and settlement systems must be adjusted to accommodate such programs.

- Retailers in PJM, New York and NEPOOL have complained that regulated rates do not reflect the true cost of wholesale power. This makes it difficult for retailers who purchase from the spot market to pass through cost increases to customers and still remain competitive against stable regulated rates.

- If markets are relatively small in size, it may not be economical for retailers to invest in the infrastructure required to create economies of scale in billing and metering required to keep costs down.

- A regulated rate based on exposure to wholesale prices may appear efficient but it fails to provide sufficient margins to allow retailers to offer customized billing options, new technologies and cost-effective risk management tools.

C) Conditions Enabling Effective Retail Markets

- The larger the market the more likely a retailer is to be able to build the economies of scale required to compete effectively.

D) Policies Enabling Effective Retail Markets

- Most states employ a regulated rate to ease the transition to full retail competition. Most of these states have had very few customers switch to competitive rates. Eliminating the regulated rate would force customers to buy from retailers. London Economics believes that market price signals need to reach consumers, but they should be given the option to hedge these prices. Providing provision for forward markets and other hedging mechanisms allows customers to procure rates, which serve to hedge price risk.

- If states do not provide customers with fixed priced regulated rates, they would encourage customers to acquire stable rate options from competitive retailers.

- Keeping the regulated rate sufficiently high to allow retailers to recover costs while offering a rate that is sufficiently lower than the regulated rate to attract customers, would encourage switching as it did in PJM.

- Allowing retailers who provide fixed priced regulated rates to recover costs if wholesale prices increase, allows retailers to stay in business.

E) Relevance to Alberta

- Alberta retailers like those in New York have been complaining about inaccurate settlement data. Retail margins are thin and small retailers cannot afford to waste time trying to reconcile data. Alberta should insure that settlement data provided to retailers is timely and accurate.

- Alberta's large incumbent utilities have little incentive to encourage residential and commercial customers to move off regulated rates. These rates can provide them with relatively high and stable returns and don't require the expense of attracting new customers. Necessity is the mother of invention. Almost all jurisdictions in the US have relatively few customers who have switched to competitive rates. As long as customers don't have to choose, they likely will not take the time to do so because the cost to figure out what to do may not be worth the value gained. London Economics believe that

customers should be forced off regulated rates provided they have options to acquire fixed priced offers from the market.

Opportunities for Alberta to Improve Red Index Score

Obtaining 100 points on the Center for the Advancement of Energy Markets' Red Index may or may not be lead to the most effective retail market structure for Alberta. The following is a summary of the areas where CEMA believes Alberta can improve its score. The reason for Alberta's current score is described and a description of what is required to improve the score is also provided.

Attribute	Score	Basis for Current Score	How to Improve Score
3. Switching	5/10	Only 30% of customers have switched from a regulated rate	50 to 100% of customers switched from a regulated rate
4. Safeguards on Distribution	7/10	Alberta allows distribution companies to possibly preferentially treat marketing affiliates	Distribution companies are wires providers only
5. Uniform Business Practices	5/10	Business practices uniform in province	Business practices are uniform nationally
7. Metering	1.5/3	Third-party metering allowed but delayed	Allows third-party metering now
9. Wholesale Market Model	2.5/5	Allows both pool and bilateral deals	Encourages only bilateral deals[1]
12. Customer Information	.6/3	Customer info to marketers is not standardized or comprehensive	Standardized and comprehensive information provided for customers who do not object
13. Consumer Education	1.5/3	Education about alternative suppliers	Education evaluating customer knowledge about how to select alternative suppliers
14. Default Provider	2.1/3	Any company other than native utility can be a default supplier	All customers have switch off default rate
15. Default Provider Price Risk	2.4/3	Wholesale prices are passed through to customer	No default provider is available
16. Default Provider Rates	1.5/3	Rate based on Cost of Service	No default provider
17. Performance-based Pricing for Distribution	1.5/3	Some distribution companies are using PBP	All distribution companies are using PBP
18. Network Pricing	1.2/3	Two of five principles are required	Five of the principles are required
19. Interconnection to Grid	1.5/3	Some action taken to encourage distributed generation	Aggressive action taken to encourage distributed generation
20. Regulatory convergence	1/2	Integrated decision making on some issues	Integrated decision making for gas and electric services policies
21. Commission Reengineering	0/2	No action taken to reform its procedures or organization	A comprehensive reform has taken place regarding internal organization and practices

[1] Restricting market opportunities and removing a clear commodity price signal may not make sense.

Glossary

Ancillary Services: These are services a jurisdiction procures, which are ancillary to the supply of energy and support the operation of the power system. The most common form of ancillary services are reserves. Reserves are supplies of energy that can be called upon when needed to balance supply and demand. There are three basic kinds of reserves. Operating reserves can be fluctuated in real time to balance supply and demand. Spinning reserves can be called upon if there is a failure in the system, such as a generator going down, generally within 10 minutes. Supplement reserves are required to back stop other severe system failures but typically with less notice. Both generators and loads are able in some markets to provide ancillary services. In some markets, the supply of VARs and black start capability are considered ancillary services.

Bilateral Contracts: Bilateral contracts are physical contracts between buyers and sellers in Alberta. Since all power bought and sold in Alberta must be exchanged through the pool the mechanism for facilitating bilateral contracts is the Direct Sales Agreement. The bilateral contract is registered with the pool to allow the pool to manage the scheduling and dispatch of power and to assess settlement fees. If the seller of power fails to dispatch sufficient capacity to supply the bilateral contract, the customer receives the power from the pool and the supplier is charged for the cost of the power based on the pool price. It may be advantageous for the supplier to not dispatch if the pool price is lower then their marginal cost of generating power. Therefore it is typical for suppliers under bilateral contracts to bid in their marginal cost of generation. That is what the Balancing Pool is doing with Cloverbar. The bid price acts only as a signal to dispatch the units. Neither the seller nor the buyer are charged or credited the pool price as long as the supplier supplies the contracted load and the buyer takes the contracted MWs. Contracts for differences are a financial mechanism for fixing the price of power. See below for an explanation. The Alberta Power Pool has a good short description on their site regarding direct sales.

Capacity: Capacity is a measure of the output of a power plant in MWs.

Capacity Market: Capacity markets allow for the trading of call options on the output or capacity of power plants. The owner of a capacity entitlement would be able to call on the plant to deliver a certain number of MWs. If the owner of the capacity entitlement actually did call on the capacity, the owner of the entitlement would be obligated to pay for the energy purchased.

Capacity Assurance: There are three basic ways to incent generators to provide adequate capacity to maintain sufficient reserves to keep power flowing in the system. The first is relying on the energy market to provide price signals, which allow developers to forecast the need for generation several years out. Some economists believe that tight supplies in the energy market send price signals to developers three years too late. The second approach is to use a capacity adder to provide additional payments to all generators equal to the value of lost load to society multiplied by the probability of lost load in each hour. Developers are incented to build more generation as these adders increase in value. The UK uses this approach. The third approach requires load-serving entities to maintain capacity to serve these loads plus a reserve margin. Penalties are applied for failing to maintain reserves, which incent load-serving entities to pay developers to provide sufficient capacity. Most markets in the U.S. employ capacity markets.

Congestion: If the demand in a region is such that there is insufficient transmission to supply that region with power from other regions at below the system marginal price, the transmission system is congested. Generation in the congested region would have to dispatch generation, which is more expensive than the system marginal price. Generation is dispatched out of merit order and other cheaper generation is dispatched off.

Congestion Management: Congestion management attempts to provide incentives for market players to reduce the costs associated with congestion. Location based marginal pricing, sets a different system marginal price for each congested region in a jurisdiction. The extra cost associated with paying generators more than the jurisdictional system marginal price to cause them to dispatch (and the charge required to compensate generators for not being allowed to dispatch) must be charged to customers. This charge is called an uplift charge. It can be charged to all customers in the system. However, doing so does not send a signal to those who caused the congestion to do something about it. Charging the full cost of the congestion to the congested region may not be fair, but they are the only ones who can respond to price signals, by reducing load, to clear the congestion. In addition, applying the congestion charge to the congested region incents new transmission and generation to reduce congestion.

Contracts for Differences: A contract for differences (CFD's) is a financial contract whereby parties agree to pay each other the difference by which the spot price is greater or lower than a fixed price. It is a contract used to fix the price of power. For example, it two parties wanted to fix the price of power at $50 / MWh and the pool price is $61 / MWh, the seller of power would obtain $61 dollars from the pool and the buyer would pay $61 / MWh to obtain power from the pool. If the seller of power provides the buyer with $11 / MWh both parties effectively pay and receive $50 / MWh for the power. Sellers of power with CFD's have an incentive to bid low prices to insure that their plants are dispatched so that they obtain pool revenues for their energy.

Demand Side Bidding: Consumers of power place bids into the pool at prices above which they would not be willing to buy power. An exporter would potentially bid in a price above which it would not be able to sell the power for a profit. A customer able to curtail production might bid in a price above, which it would lose an unacceptable amount of money.

Firm Transmission Rights (FTRs): See Location Based Transmission Pricing for an explanation.

Load Serving Entity: In many jurisdictions, LSE's are the distribution companies and retailers who have commitments to provide power to end-users.

Location Based Transmission Pricing: Entities in regions with lower prices have an incentive to sell their power in regions with higher prices. Owning transmission capacity to take advantage of this arbitrage opportunity has value. However, entities with contracts to buy power in other regions face the risk that congestion will drive prices up in those regions. Having a financial call on transmission capacity allows an entity to obtain the basis differential between both ends of the line. This would allow an entity to hedge itself against congestion price distortions between regions. Firm Transmission Rights (FTRs) can be auctioned by transmission owners. As the value of these rights increase, the owners have an increased incentive to build more transmission. Doing so decreases congestion constraints between regions. However, because of the economies of scale associated with transmission, economists don't believe that prices will rise sufficiently high in the short term to recover costs for initial excess capacity. In addition, this transmission

pricing approach is not expected to be able to recover the sunk costs of existing generation. As a result, economists encourage the use of other mechanisms to encourage new transmission and the recovery of existing transmission costs.

Tight Pool: A tight pool requires that all power generated be exchanged through a power pool. Bilateral contracts are allowed, but the power must be bid into the pool.

Wholesale Market: Wholesale markets provide for the sale of generation supply to meet demand. Supply includes energy, capacity and ancillary services. The options for selling supply include trading in a pool, bilateral markets and forward financial and physical markets.

Appendix E

GLOSSARY OF TERMS

Alberta Department of Energy (ADOE)

The provincial department responsible for developing and administering policies for the Alberta energy industries.

Alberta Energy and Utilities Board (AEUB)

The provincial body responsible for regulating certain parts of the energy industry in Alberta.

Balancing Pool (BP)

The Balancing Pool is a financial account administered by the Power Pool of Alberta. Its main purpose is to ensure the costs and benefits of existing generating units continue to be shared among all Albertans. A secondary purpose is to backstop the Power Purchase Arrangements (PPA) in the event of a default by a PPA holder.

Congestion

The condition under which the transactions that market participants wish to implement exceed the constraints on the transmission grid. Congestion usually requires the system operator to adjust the output of generators, decreasing it in one area to relieve the constraint and increasing it in another to continue to meet customer demand.

Deregulation

A process to replace the setting of prices by regulation with open markets where prices will be determined by competition and innovation in as many parts of the Alberta electricity system in which markets can be developed.

Distribution

Distribution refers to the low voltage power lines and related facilities that carry power from the transmission grid to the end-use customers.

ENMAX

The City of Calgary electric system originally set up to deliver power to Calgary consumers, but under deregulation now able to sell power anywhere in Alberta or elsewhere, and also to undertake other functions in the electrical industry.

EPCOR

The City of Edmonton electric system originally set up to generate and deliver power to Edmonton consumers, but under deregulation now able to sell power anywhere in Alberta or elsewhere, and also to undertake other functions in the electrical industry.

ESBI Alberta Ltd. (EAL)

ESBI Alberta Ltd. was selected through a RFP process to assume the role of Alberta's transmission administrator beginning June 1998. The transmission administrator function was created under the *Electric Utilities Act* in 1995. ESBI is tasked with ensuring fair and open access to Alberta's transmission system. The EAL contract expires later in 2002

Independent Assessment Team (IAT)

A team of multi-disciplinary experts appointed by the Minister of Energy to determine terms and conditions of the PPAs.

Independent System Operator (ISO)

An ISO is responsible for administering one or more short-run markets in electricity, system operations planning, as well as the real time management of the electric system, including the dispatch of energy, and management of congestion, and administration of the transmission system, including the transmission tariffs. The ISO can also oversee the settlement process for Participants. The ISO monitors market performance and can implement changes to ensure the efficient operations of both the market and the electric system.

Liquidity

Liquidity is a measure of the ease with which a market player can buy or sell in the marketplace. A large number of buyers and sellers as well as a high trading volume are important components of a liquid market.

Market Achievement Plan (MAP)

The objective is to provide Alberta consumers, retailers and marketers the opportunity to buy electricity contracts associated with the unsold Power Purchasing Agreements (PPA's) which are held by the Balancing Pool.

Market Power

Market power or "an abuse of market power" can be defined in a number of ways. Market power can be defined as the ability to affect changes to the market clearing price for sustained periods of time, whereby sustained can be either duration in time or repetition over time. Firms can maintain market power by creating barriers to the entry of new competition. Mitigating market power will lead to increased competition.

Market Surveillance Administrator (MSA)

The MSA is presently a member of Power Pool Council with responsibility to oversee market performance, including detecting any anti-competitive behavior.

Pancaking

Rate pancaking occurs when a transmission customer is forced to pay multiple separate rates for a transaction that crosses multiple transmission systems.

Power Pool of Alberta

The Power Pool is the market through which electricity in the province is exchanged. Producers sell power into the Pool and consumers buy power through the Pool at a single price.

Power Purchase Arrangement (PPA)

A long term contract (maximum 20 years) to be set for the regulated generating units as determined by the IAT and approved by the AEUB.

Regional Transmission Organization (RTO)

An organization set up to bring transmission facilities in various adjacent jurisdictions together in a cooperative activity to facilitate the efficient movement of power in that region.

Regulated Rate Option (RRO)

The RRO provides residential, farm, and small-business customers with the option to choose a regulated energy charge. The RRO is available until 2005 for customers who use less than 250 MWh/yr. The RRO was automatically provided to all eligible customers who had not selected an alternative electricity retailer by January 1, 2001. The RRO expires end of 2003 for business, and end of 2005 for residential and farms.

Reserve Capacity

Reserve capacity is an amount, usually a percentage, of the total installed generating capacity, that must be available on short notice to provide power to the grid when a significant amount of generating capacity is lost by an on-line generator failing or having to be shut down.

Retailer

A person who sells or provides retail services directly to customers.

Rural Electrification Associations (REA)

Organizations which provide rural communities with support for their electrical needs and services in order to insure fair and equitable electrical service for rural customers. There are currently 65 REAs in Alberta.

Scenarios

Scenarios are plausible and alternate outlines of the way the future might unfold for a given activity such as the electrical industry in Alberta. A scenario is not a prediction of the future, nor is it meant to advocate any particular event in the outline.

Time of Use Metering

Recording meters that measures both the amount of power consumed and the time of day at which it was consumed by an end-use customer.

Transmission

Transmission is the system of high voltage lines and related facilities that link generating units and loads throughout the province.

Transmission Administrator (TA)

The Transmission Administrator is responsible for ensuring open and Non-discriminatory access to the Power Pool by buyers and sellers of electricity. On June 1, 1998, ESBI Alberta Ltd. was appointed by the Minister as the TA in Alberta. The ESBI contract expires later in 2002.